NY PUBLIC LIBRARY THE BRANCH LIBRARIES
3 3333 02256 3718
B BILLINGS
GARRISON, FIELDING H.
JOHN SHAW BILLINGS :
A MEMOIR
10.95
NNBR 906353963
SIBL
The New York Public Library
Astor, Lenox and Tilden Foundations
NOV 1990
The Branch Libraries
The Branch Libraries
SCIENCE, INDUSTRY
AND BUSINESS LIBRARY
188 Madison Avenue
New York, NY 10016
SIBL
Books and non-print media may be returned to any branch of The New York Public Library.
Materials must be returned by the last date stamped on the card. Fines are charged for overdue items.
Form #0690
THE NEW YORK PUBLIC LIBRARY

Digitized by the Internet Archive
in 2007 with funding from
Microsoft Corporation

http://www.archive.org/details/johnshawbillings00garr

54 - G-2

John Shaw Billings

A Memoir

By

Fielding H. Garrison, M.D.

Illustrated

G. P. Putnam's Sons
New York and London
The Knickerbocker Press
1915

CENTRAL RESERVE
5TH AVE. & 42ND ST., ROOM 100

Copyright, 1915
BY
JOHN SEDGWICK FILLINGS

The Knickerbocker Press, New York

B-BILLINGS
2256 3718
MM
SCI
B
B 5585
9

PREFACE

WHEN Dr. Billings died in New York, on March 11, 1913, he was principally known to the metropolis and to many of the world at large as the Director of the New York Public Library and its upbuilder during the first seventeen years of its existence. The newspaper notices of his death, and even the obituaries in most of the medical journals, mentioned his military rank, his official connections at Washington and elsewhere, and a few other details, but little was said of the things for which he will be best remembered. He has been pronounced by a competent authority to be the most eminent bibliographer in the history of medicine; he planned and organized one of the greatest of medical libraries and some of the finest hospitals and laboratories of modern times. He was equally eminent as sanitarian and statistician, or as war surgeon and medical historian, and was, all in all, one of the ablest of civil administrators.

This account of his life and labors has been prepared as a memorial at the instance of his family and friends. While the records of his early life are meagre, the account given in his letters and notebooks of his experiences as a medical officer during the Civil War is, in some sort, a contribution to history. For, as the late Dr. Weir Mitchell once observed, no adequate record of the actual details of an army surgeon's daily life during that period has been published to date. Billings's journal gives us a vivid impression of the marches, battles, and engage-

20189

ments of Hooker's and Grant's campaigns, viewed, as it were, from the staff surgeon's angle, from behind the scenes. After the close of the war, Dr. Billings's career was one of most extraordinary activity and accomplishment. His three greatest achievements, the Surgeon-General's Library and its Index Catalogue, the Johns Hopkins Hospital, and the New York Public Library, have been set forth in three separate historical chapters which explain themselves. As most of Billings's essays and monographs, important things in the light of medical history, are buried in the back files of periodicals and in forgotten text-books, no apology is offered for the inclusion of liberal citations, each of which is, in a record of this kind, *memoriæ positum*.

In preparing this memoir, the writer desires to express his deep obligations and grateful acknowledgments to the Adjutant-General, United States Army, for a precise and accurate record of Dr. Billings's army appointments and assignments; to General Alfred A. Woodhull, United States Army, for his searching critical review of the war chapter, and for much valuable information bearing upon United States Army regulations and other military matters; to Miss Acland (Oxford) and Admiral Sir William A. Dyke Acland, R. N. (Torquay), to General A. A. Woodhull (Princeton), and to Dr. A. Jacobi (New York), for the generous loan of private letters; to Mr. Edwin H. Anderson, Director of the New York Public Library, and Mr. H. M. Lydenberg, its Reference Librarian; to President Charles W. Eliot (Boston), President Robert S. Woodward of the Carnegie Institution of Washington, Professor William H. Welch (Baltimore), Dr. John S. Billings, Jr. (New York), and others for valuable information.

The excellent and accurate bibliography of Dr. Billings's writings is the work of Miss Adelaide R. Hasse of the New York Public Library.

2256 3118

The critical correction of the copy for the printers and the proof-reading has been supervised by Dr. Frank J. Stockman of the Surgeon-General's Library, Washington, D. C.

F. H. G.

WASHINGTON, D. C.
March 3, 1915.

CONTENTS

CHAPTER		PAGE
I.	Early Days	1
II.	Experiences of a Medical Officer during the Civil War	19
III.	Official Life in Washington	136
IV.	The Johns Hopkins Hospital and Medical School	181
V.	The Surgeon-General's Library and Catalogue	213
VI.	Philadelphia	278
VII.	The New York Public Library	288
VIII.	Scientific and Literary Work	336
IX.	Character and Personality	376

APPENDICES

I.	Genealogy of the Billings family by the late Mrs. J. S. Billings	397
II.	Military Record	408
III.	Bibliography of the writings of Dr. John S. Billings by Miss Adelaide R. Hasse	411

ILLUSTRATIONS

	PAGE
JOHN SHAW BILLINGS. 1908—ÆT. 70 .	*Frontispiece*
JOHN SHAW BILLINGS. 1863—ÆT. 25 . . .	20
CLIFFBURNE HOSPITAL, WASHINGTON, D. C.—1862 .	138
THE JOHNS HOPKINS HOSPITAL, BALTIMORE, MD. .	182
THE ARMY MEDICAL LIBRARY, WASHINGTON, D. C. .	214
JOHN SHAW BILLINGS. 1889—ÆT. 51 . . .	280
THE NEW YORK PUBLIC LIBRARY	290

PROPERTY OF THE
CITY OF NEW YORK

John Shaw Billings

CHAPTER I

EARLY DAYS

AMONG the colonists who settled in America before the Revolution was William Billing, of Taunton, England, who sold his estate of Deanes to his brother, Ebenezer Billing of Glastonbury, and came to New England about the middle of the seventeenth century. His father, William Billing, the youngest son of Richard Billing of Taunton, was descended in a direct line from Sir Thomas Billing, eldest son of John Billing of Rowell. Sir Thomas Billing, a serjeant-in-law (1453), was knighted, in 1458, for his services to the Lancastrian party, became Justice of the King's Bench in 1465, Lord Chief Justice of the King's Bench in 1468, and, dying in 1481, was buried in Battlesden Abbey, where the inscription on his tomb can still be read.

In 1654, it is of record that William Billing was one of the original proprietors of Lancaster, Massachusetts, but, after his marriage, on February 5, 1654, he joined the company of William Cheeseborough at Stonington, Connecticut, where he became one of the largest landed proprietors in that and neighbouring towns. He died on March 16, 1713. Of his twelve children, Ebenezer, the

second son, left nine children who thereafter bore the name of Billings. Of these, James, the fourth son (born October 4, 1688) was the father of Jesse Billings (born April 18, 1737), a soldier in the War of the Revolution, who was the grandfather of James Billings (born March 1, 1806) of Saratoga, New York. On July 21, 1835, James Billings married Abby Shaw, of Raynham, Massachusetts, who was a lineal descendant of John Howland, one of the Pilgrims. In course of time, James Billings removed from Saratoga to Indiana, and, in the later years of his life, lived at Dayton, Ohio, where he died on March 8, 1892. Of his five children, three died in infancy. The survivors were a daughter, Emma, and the subject of this narrative.

John Shaw Billings was born on April 12, 1838, in Cotton Township, Switzerland County, Indiana, a sparsely settled section in the south-eastern angle of the State. When he was about five years old, his father removed to a farm on Narragansett Bay, Rhode Island, but about five years later he returned to Indiana and engaged in mercantile business in Allensville, in the neighbourhood in which he had previously lived.

Of these early days, we have, fortunately, a striking record in the fragment of an autobiography which Dr. Billings himself sketched out at the instance of his friends a few years before his death:

> I first got a realizing sense of my own personality or individuality when, a boy about eight years old, I was at work on a hillside on the farm of Tristram Burgers,[1] near Providence, R. I. My father was the manager of this farm, and my business that sunny afternoon was to chop up and dig out by the roots all the Canada thistles I could find in the pasture.
>
> I had read the Bible through—verse by verse, also *Robinson*

[1] Perhaps this refers to Tristam Burges [1770–1853], of Providence, Rhode Island, who held many important offices in the State, and represented it in Congress in 1825–35.

Crusoe, *Deerslayer*, *Pathfinder*, and *Pilgrim's Progress*—but I had never done any thinking that I can remember. But on this memorable afternoon, I stood on the hillside and looked over Narragansett Bay, and wondered where all the catboats and schooners with their white sails came from, and were going to. Then my thoughts took this turn: "The only person who can know that is God. He knows everything that has been, and is, and is to be. Then, hundreds and thousands of years ago, He knew that I should be here today, and that each of those boats would be just where it is, and that I should be thinking of them. Then, as His knowledge must have been perfect, it is absolutely necessary that I, just as I am, knowing just what I know, am here at this moment, looking at these ships, which also must be just where they are. Then everything must be arranged and ordered to be just as it is, and no one can prevent it. Therefore, I am not responsible for where I am nor for what I do." I was surprised at this conclusion, and thought I had made a great discovery, and resolved to tell my mother about it when she was worrying about our troubles. I did tell her about it that night, and said that there was no use in worrying any more. She looked at me in a scornful sort of way, and said, "Who's been teaching you about foreordination." "Nobody taught me," said I. "I found it out by myself—don't you see it must be so?"

My life on the Burgers' farm, from about five to ten years of age, was that of an ordinary farmer's boy. I dropped four or five grains of sweet corn in the proper place in the furrow in planting time, I helped weed the little carrots and young beets, rode the horse for horse-raking the hay crop, went to a country school for three months in the winter, made little clam-bakes along the shore with my cousins William Henry and Charles Shaw, and read everything I could lay hands on. I managed to get a dollar for subscription to a little lending library in a book shop, and the first books I took out were *Deerslayer*, *Pathfinder*, and *Jock o' the Mill*. I had for my own, *Robinson Crusoe*, *Marco Paul in the Forests of Maine*, *Harry and Lucy*, and Plutarch's *Lives*, and was quite sure that I did not want to be a farmer.

When I was about ten years old, my father moved to Indiana and established himself in a little crossroads village called Allensville, on the road from Rising Sun to Vevay. Here he kept a country store—was postmaster, and had a small shoemaker's shop in which one man was employed. I learned something of shoemaking—had some experiences in keeping store. I read incessantly. Came across a book—I have forgotten its title—which had a number of Latin quotations in it, asked a young clergyman (John C. Bonham) how I could learn Latin—and got a Latin grammar and reader—a copy of *Cæsar*, and a Latin dictionary, and set to work. It was difficult, but with the aid of Mr. Bonham I made good progress. Then I made an agreement with my father that if he would help me through college in the least expensive way, all of his property should go to my sister, and that I must expect nothing more. I then got some Greek books, a geometry, etc., and went on to fit myself to pass the entrance examination for the sub-freshman class at Miami University, Oxford, Ohio. I succeeded in doing this in a year—and passed the examination in the fall of 1852. For the first two years I kept bachelor's hall, living on bread, milk, potatoes, eggs, ham, etc., such things as I could cook for myself. The lessons gave me little trouble. Most of my time was spent in reading the books in the College Library. I was omnivorous, read everything in English as it came, philosophy, theology, natural science, history, travels, and fiction.

Of his early days, apart from this slight sketch, Dr. Billings has left only a line, a passing reference to "the time when we were boys, scattered through the valley of the two Miamis, through Indiana clearings and old Kentucky homes, and when a day hunt for squirrels and Bob White or a night expedition after coons was among the most important business of life."[1] Before the age of fifteen, as he has indicated, he bought a Latin dictionary and grammar with his small savings, in order to make out the meaning of classical quotations encountered in his

[1] *Cincinnati Lancet-Clinic*, 1888, n. s., xx., 304.

reading. His teacher was Rev. John C. Bonham who, in a letter to *The Recorder* (newspaper) of Rising Sun, Indiana (July 19, 1895), says:

In the early fifties, in Allensville, I was hearing him recite lessons in Latin and Greek, so big that no average pupil could have learned them! He had a marvellous memory. I never met his equal. None of my teachers ever thought of giving us half as long lessons in Cæsar's *Commentaries* and Xenophon's *Anabasis* as I gave him, and even then were denied the privilege of having them so accurately translated or so well understood. He was a bright pupil, and I have been pleased, but not surprised, by his success.

When he took his degree of Bachelor of Arts at Miami University in 1857, he graduated with the second honour in his class, which consisted in the delivery of the Latin Salutatory. Three successive drafts of this exist, carefully written out in his schoolboy hand on parchment-like paper, with the faint pencilled corrections of his preceptor, the final version being, on the whole, a creditable enough specimen of these antiquated and perfunctory performances, in which the usual Ciceronian flourishes sometimes alternated with touches of macaronic humour:

Omnes parati sumus vestros cordes movere et vestras mentes convincere cum gratissima eloquentia et solum vestrum opus est quiescere et audire. Verisimile est ut discatis qua neque vos nec ulli antehac sciverunt. Demum qui esset Junius invenietis et accuratam descriptionem viri qui Guilielmum Patersonem planxerit habebitis et secedetis perfecti convicti ut solum una Oxonia est et illius lumines seniores sunt. Torrens ingenii, qualem mundus nondum vidit, effusurus est sed si non affecti manetis et videmini quasi illud jamdudum sciebatis vestri comites putabant ut sit, quod congruat tamquam si esset.

During the summer months, young John Billings eked out his slender means by tutoring. In term time, he and

other college boys kept bachelor's hall in the "old south-east dormitory in the college campus," very much, no doubt, as he himself described their life long after in his sketch "How Tom Kept Bachelor's Hall."[1]

There were no servants, waiters or scouts about the "old south-east"; you had to carry your own wood and water in, and your own ashes and rubbish out. Bread and milk were delivered once a day by the baker and milkman, but all other articles of food must be brought from the village, a few hundred yards away.

Tom was what is called a natural born cook; and he was also a very bad violin player. Of course, therefore, he was much prouder of his ability to give a halting and mangled rendering of the *Arkansas Traveller* or *Money Musk* with his fiddle than of his uniform success in producing delicious buckwheat cakes.

One of Tom's special dishes was papered eggs. As it was much easier to learn to cook these than it was to make buckwheat batter come out right in the morning, a good many of the boys, including some who lived in boarding-houses, mastered the technicalities of their preparation. Thus papered eggs became a common dish in the "south-east"—especially about eleven o'clock on winters' nights.

Now the art and mystery of papered eggs is as follows: Take a half-sheet of stout letter paper, fold up the edges all round and fasten them at the corners with pins, so as to form a shallow pan about an inch deep.

Break half-a-dozen eggs into a dish, put the paper pan on the top of a hot stove, and tip the eggs into it before it begins to scorch.

Add pepper and salt, and with a spoon scrape up the egg from the bottom of the paper pan as fast as it begins to harden, so that the liquid part may run in and keep the bottom moist, in order to prevent the paper from burning. When the whole is sufficiently cooked take it off the stove and eat it hot from the pan.

[1] *Youth's Companion*, Phila., November 10, 1892, pp. 598–599.

You see that in this way one is always sure of having a clean pan and a clean dish, which are things that a boy housekeeper does not always provide for himself. It is not the cooking itself, nor the serving the meal, that worries a boy, so much as it is the cleaning up and putting away of things just at the precise time when he wants to do something else.

The same is true with regard to making the bed. I have never known a time when it was convenient for a boy to make his own bed, and of course it had to be left occasionally, say about five mornings a week, with merely pulling up the spread so as to cover the disorder beneath.

Every night when we got into a bed that had been left in that way we admitted that it was better to make it up every morning; but when the morning came, and there was just time to get into one's clothes and get to chapel by the time the bell had stopped, it was no use to think about bed-making.

Tom had one special advantage over the rest of the boys in his housekeeping, and that was that he could sweep his floor into his fireplace and burn his rubbish, instead of being compelled to sweep it under the bed for six days in the week, and painfully gather up the collection and throw it out of the window on the seventh, as was the general custom among the "south-easters." As for dusting, that was only done when circumstances rendered it absolutely necessary.

The possession of a fireplace also made it possible to broil a steak or a chicken, and Tom was the only boy who possessed a gridiron. Like the rest of us, however, he preferred the frying-pan for regular use, partly, as he said, because it did not scorch his face, and partly on account of the possibilities which it afforded for mixtures of hot fat, flour and water, which were dignified by the name of gravy.

Many labour-saving contrivances were employed in Tom's culinary department which have not yet been described in cookery books; as, for instance the boiling of the breakfast eggs in the hot coffee. In fact the whole business was a persistent effort to work along the lines of least resistance.

Upon his graduation from Miami University, Billings got a number of testimonials from J. W. Hall, the president of the institution, Charles Elliott, professor of Greek, R. W. MacFarland, professor of mathematics, and others, in aid of obtaining employment as a tutor, to carry out his plan of studying medicine. All these documents concur in praise of his capacity and scholarship. The Greek professor describes him as "a young man of very superior talents and extensive acquirements," and adds, "I have observed, moreover, that he possesses great facility in communicating what he knows." This trait, which was to be one of his strongest assets in after-life, was, by a strange chance, to find its earliest account in a novel and more remunerative field than tutoring. An exhibitor of lantern-slide pictures, a sort of forerunner of the Stoddards and Elmendorfs of our day, found himself at a loss for the proper running commentary of explanatory discourse. Billings offered to supply the deficiency for a consideration and occupied himself by lecturing in this way through the summer following his graduation. In the autumn of 1858, he matriculated at the Medical College of Ohio. This institution was the tenth medical college founded in this country and, following the medical school of Transylvania University (Lexington, Kentucky), the second to be established west of the Alleghanies (1819). Its founder was the celebrated Daniel Drake, "a man," as Billings has said, "whose fame, as compared with that of his contemporaries, will probably be greater a century hence than it is to-day, and whose name, even now, should be among the first on the list of the illustrious dead of the medical profession of the United States." After the State Legislature had passed the act organizing the Medical College of Ohio (January 19, 1819), Drake, who filled the chairs of the Institutes and Practice of Medicine, Obstetrics, Diseases of Women and Children, found it

desirable to get rid of a certain obnoxious member of the faculty and induced the General Assembly of the State to pass an amended act (December, 1819), through which a professor could be appointed or dismissed by the concurrence of two-thirds of the faculty. "Soon after," Billings goes on to say,

> the two-thirds rule was applied with a sort of boomerang effect. The faculty of three had a meeting, Dr. Drake being in the chair. Dr. Smith moved that Daniel Drake, M.D., be dismissed from the Medical College of Ohio. Dr. Slack seconded it; Drake put the motion, which was carried, and then returning thanks, was lighted downstairs by Dr. Smith, who used the single tallow dip candle which had served to illuminate this remarkable faculty meeting. . . . Dr. Drake was a great organizer, and a great disorganizer, a founder and a founderer, and his trip downstairs by the light of the tallow dip was by no means the end of his relations with this school. He fought it bitterly, organized other schools, went to Lexington, to Philadelphia, and to Louisville, as teacher, editor, etc., but when his restless, laborious life ended, in 1852, he was again a professor of this school which he had founded, and which was, after all, more interesting to him than any other.[1]

When Billings came to the school in the autumn of 1858, the Miami Medical College had just combined with it, and the leading members of its faculty were George C. Blackman (1819–71) of Connecticut, professor of surgery, and James Graham (1819–79) of Ohio, professor of materia medica:

> The first was my preceptor, the second a warm personal friend. I could not speak of them impartially if I would, and I would not if I could. They were a contrast to each other in most respects, physically and mentally.
>
> Blackman was stout, of dark complexion—tropical—a

[1] *Cincinnati Lancet-Clinic*, 1888, n. s., xx., 298–299.

creature of impulse, thoroughly familiar with surgical literature, and with a quotation always ready, a bold and skilful operator, but one who hated to attend his cases after the operation; a genial, dictatorial, generous, jealous, unhappy genius, who was best and greatest in the amphitheatre with a difficult case before him.

Graham was slender, graceful, of light complexion, a shrewd and rapid reasoner, a marvellous diagnostician, a most eloquent lecturer, a man who would have made a great lawyer or politician, and who was fascinating to those whom he honoured with his friendship; often sarcastic and a scoffer, yet generously ready to help, a man who did not write, whose fame is altogether local, whose best work was in clinical teaching and in holding the family together.[1]

The men who developed the medicine of the almost frontier civilization of the then Middle West were trained in a rugged school of hardship and continual struggle with obstacles which few could overleap who had not attained to the proper strain of manly fortitude, independence, and endurance. Drake, at bottom a man of gentle nature, a poet and a lover of children, hating coarseness and vulgarity, once got into a rough-and-tumble fight with a sarcastic rival who came off with a blackened eye and a laid-open scalp. Blackman, a pupil of Sir William Fergusson, a brilliant operator who translated Velpeau's *Surgery* and once was banqueted with enthusiasm by the entire surgical profession of New York City, was forever wrangling with his Cincinnati colleagues and is described as "violent, dictatorial, jealous, suspicious or melancholy . . . a hard man to get along with, all on account of his unbalanced temperament."[2] While serving as a brigade surgeon of volunteers during the Civil War, he once kicked a refractory negro waiter the whole length of the deck

[1] *Cincinnati Lancet-Clinic*, 1888, n. s., xx., p. 301.

[2] Otto Juettner, *Daniel Drake*, Cincinnati, 1909, p. 232.

of a hospital ship. Yet he fainted during the vivisection of a pigeon, and was such a child in money matters that he died destitute. Graham, who, in the lecture-room, was a talented, captivating actor of the Dieulafoy type, a sort of clinical Henry Clay, became a whimsical old bachelor because he could not avoid quarrelling with the father of the lady of his choice, and prosperous as he was, sat mewed up all his life in a shabby office in a little two-story house, sneering at the holes in his ragged carpet as being "worn by patients" and prodding his visitors with sly Celtic sarcasm.

All these men were crudely combative, yet, by the same token, not without a certain rough and genuine kindliness, like that which Drake displayed towards the ill-starred Maryland anatomist Godman. The two years which young Billings spent in the study of medicine were, in respect of privation, the hardest of his life. Here he became acquainted with the uses of adversity and felt "the iron band of poverty and necessity," which Emerson, speaking of similar conditions in the early days of the New England community, regarded as a prime factor in the development of integrity and independence of mind and character in the youth of those days, some of whom became the "strong men, with empires in their brains," who laid the foundations of American civilization under these frontier conditions. Billings managed to pay his way through his medical course by residing in the hospital and later taking care of the dissecting rooms of the college. Dr. Weir Mitchell relates that "of these years of privation he spoke to me once or twice, with assurance of his belief that he never recovered from the effect of one winter in which he lived on seventy-five cents a week."

Of this period of his life we know little beyond the few reminiscences which he has himself given in "The Medical College of Ohio before the War"[1]:

[1] *Cincinnati Lancet-Clinic*, 1888, n. s., xx., 304.

The men of my time will remember the old Commercial Hospital, with its pest-house in the back yard, and its peculiar atmosphere; for ventilation was practically unknown and scarcely even spoken of in those days.

The old St. John's too, with its grassy slopes and the great trees in front, and with Sister Anthony and her devoted band of helpers, remains a vivid picture. But the main thing to us then was the Faculty, those who undertook to make doctors of us, provided we had been thinking about medicine for a year before we came, and would attend two courses of lectures.

We miss the most of them: Lawson and Graham, Blackman, Mendenhall, Judkins, Wright and Clendenin are not here, but there are a few left, and long may they flourish. To us the place of our old teachers can never seem to be quite filled, any more than we can now find any wine which is as good as Longworth's "Golden Wedding" brand used to be on the rare occasions when we made its acquaintance; but we know that while the world spins round just the same science has been advancing, teaching has been improving, and that the graduates of today could tell the men of our time things that would astonish them immensely. Twenty-eight years ago we heard nothing of bacteria, antiseptic surgery was unknown, the clinical thermometer and the hypodermic syringe were just new fangled notions that had not come into use and that few of us had even seen.

In those days they taught us medicine as you teach boys to swim, by throwing them into the water.

The first medical lecture I ever listened to was a clinical one, at which three or four cases of chronic lung disease were shown and prescribed for. At a much later period in the course I heard lectures about tubercle and the tubercle corpuscle, and Virchow's theories of the same, on which I should not at all like to stand an examination to-day. But I have never forgotten the few remarks in that first clinical lecture on the significance of slight, jerking respiration and prolonged expiration heard under the left clavicle, or on the need for out-door life for such cases, and I could still give the formula for the placebo cough mixture which was ordered, and which I have since found useful.

"Much water has run down" in the thirty years which have passed since Professor Conner and myself met in Dr. Wood's office to recite the results of our first wrestle with Erasmus Wilson's description of the occipital bone,—many of our classmates and friends have finished their work and can never again come back to us, save through the ivory gate of dreams.

During 1858–59, Billings was interne at the St. John's Hospital and during 1859–60, he held a similar position in the Commercial Hospital of Cincinnati. While in residence at the former institution he came in contact with one who was to be a constant and loyal friend in after-life. This was Sister Anthony (O'Connell)[1] who had been in

[1] Sister Anthony was a native of Limerick, Ireland, who, coming to America as a child, entered the Community at Emmitsburg, and, after settling in Cincinnati in 1837, was successively in charge of the orphans at St. Peter's Orphan Asylum, St. Aloysius Asylum (1853), and St. Joseph Orphanage (1854). During the Civil War Sister Anthony played a part like that of Florence Nightingale in the Crimea. She sprang into action at once, not only in the wards of St. John's, which was soon filled to overflowing with wounded soldiers, but on the battlefield as well. "To the soldiers of both armies," says Juettner, "her name had a magic ring of wonderful power. To them she was the incarnation of angelic goodness that seemed like a visitation from realms celestial. On the battlefield of Shiloh, amid a veritable ocean of blood, she performed the most revolting duties to these poor soldiers. Neither the cries of anguish of the dying nor the unbearable stench from dead bodies could check her in her ministrations. To the young soldier that lay, fatally wounded, upon that bloody ground and was thinking of a lone mother at home, Sister Anthony brought the comfort and peace of a mother's care. In such moments, it was the instinct of the woman in her that enabled her to soothe the aching heart while relieving the pangs of physical suffering. Then again she stood bravely and attentively at the side of George Blackman, helping him in his operative work on the deck of one of the floating hospitals of the Ohio River. Limbs were quickly amputated and consigned to a watery grave. There seemed to be no limit to Blackman's endurance. But no matter how hard the work or how trying the scene, Sister Anthony was always at her post, her only regret being that she could not do more for her fellow-men, for her country and for her God. It was this kind of a record that has perpetuated her name beside those of the most famous commanders." Otto Juettner, *Daniel Drake*, Cincinnati, 1909, pp. 418–419.

charge of old St. John's since 1856, and who, with her sister ministrants, began to take a kindly interest in the young student who had come to live and work among them. It is said that his grave, serious ways, his austere life, the look of mild melancholy in his blue eyes, won their regard in such wise that he became known among these ladies as "St. John of the Hospital." They became greatly attached to him in a sisterly way, and later took pleasure in making beautiful embroidered things for his infant daughter. With Sister Anthony, he maintained a lifelong friendship.

At Harvard, Billings said, thirty-five years later:

> Some thirty-three years ago, a long time ago, "in the days when Plancus was consul," I graduated in medicine in a two-years' course of five months' lectures each, the lectures being precisely the same for each year. I had become a resident in the hospital at the end of the first year's studies. There was I a resident of the City Hospital of one hundred and fifty beds, where I was left practically alone for the next six months, the staff not troubling themselves very much to come during the summer time, when there was no teaching. Remember this was a long time ago, "when Plancus was consul." In those two years I did not attend the systematic lectures very regularly. I found that by reading the text-books, I could get more in the same time and with very much less trouble. I practically lived in the dissecting-room and in the clinics, and the very first lecture I ever heard was a clinical lecture. The systematic teaching of those times I have had to unlearn for the most part. There is a new chemistry, a new physiology, a new pathology. What has remained is what I got in the dissecting-room and in the clinics.[1]

One of the requirements for graduation of the Medical College of Ohio was the writing of a graduating disserta-

[1] *Boston Med. and Surg. Journal*, 1894, cxxxi., 141.

tion concerning which Dr. Billings said, in his Cincinnati address, that "the performance of this melancholy duty has not only influenced the greater part of my work for the last twenty years, but is the essential though remote cause of my being here to-night."

This has happened in this wise: In the thesis just referred to, it was desirable to give the statistics of the results obtained from certain surgical operations as applied to the treatment of epilepsy. To find these data in their original and authentic form required the consulting of many books, and to get at these books I not only ransacked all the libraries, public and private, to which I could get access in Cincinnati, but for those volumes not found here (and these were the greater portion), search was made in Philadelphia, New York and elsewhere, to ascertain if they were in any accessible libraries in this country.

After about six months of this sort of work and correspondence I became convinced of three things. The first was, that it involves a vast amount of time and labour to search through a thousand volumes of medical books and journals for items on a particular subject, and that the indexes of such books and journals cannot always be relied on as a guide to their contents. The second was, that there are, in existence somewhere, over 100,000 volumes of such medical books and journals, not counting pamphlets and reprints. And the third was, that while there was nowhere, in the world, a library which contained all medical literature, there was not in the United States any fairly good library, one in which a student might hope to find a large part of the literature relating to any medical subject, and that if one wished to do good bibliographical work to verify the references given by European medical writers, or to make reasonably sure that one had before him all that had been seen or done by previous observers or experimenters on a given subject, he must go to Europe and visit, not merely one, but several of the great capital cities in order to accomplish his desire.

It was this experience which led me when a favourable

opportunity offered at the close of the war, to try to establish, for the use of American physicians, a fairly complete medical library, and in connection with this to prepare a comprehensive catalogue and index which should spare medical teachers and writers the drudgery of consulting ten thousand or more different indexes, or of turning over the leaves of as many volumes to find the dozen or so references of which they might be in search.[1]

The thesis on "The Surgical Treatment of Epilepsy" was published in the *Cincinnati Lancet and Observer* (June 1861, pp. 334–341), and is a careful and creditable survey of the operations then in vogue for the condition and their indications, giving two cases from Blackman's clinic and a tabulation of seventy-two cases operated upon by other surgeons. It has for its motto the aphorism of Celsus—"*Verumque est, ad ipsam curandi rationem, nihil plus conferre, quam experientiam,*" and begins as follows:

Believing, as I do, fully in the truth of the maxim of Celsus, given above, I propose in the following article to consider the operations which have been employed from time to time by surgeons and physicians for the relief of one of the most mysterious maladies in the nosological scale, as well as one of the most rebellious to treatment. I refer to epilepsy. In this disease, certainly our boasted lamp, experience, only serves to make the darkness more visible; and I fear that the modern physician, with all the science and wisdom of this progressive nineteenth century, effects but little more with his preparations of silver and zinc than did Hippocrates with his hellebore; and it is not at all impossible that the sage of Cos was thinking of some cases of this kind when he uttered the latter part of his celebrated aphorism, "Experience doubtful, and judgment difficult."

One sentence shows his interest in the hypodermic syringe, which was just then coming into use and of which

[1] *Cincinnati Lancet-Clinic*, 1888, n. s., xx., 297.

he was careful to provide himself with a specimen on entering upon his duties as an army surgeon during the Civil War:

"In some of these cases I should advise the trial of the hypodermic, narcotic injections, introduced by Dr. Alexander Wood, of Edinburgh, for the cure of neuralgia."

The little essay concludes, as it opens, with a paragraph which already exhibits the strong common sense and subtle humour which were to distinguish the later writings of Billings:

In conclusion, if the surgeon meets with cases, and they undoubtedly will be the majority to which none of the preceding remarks apply, and feels nevertheless compelled to do something, I should advise the application of the trephine, having first fairly explained to the patient the risk he is about to run, as all that can be said of any operation applies to this, and if it does not prove immediately fatal, and he reports the case *early*, say within the first month, it will in very many cases come into the list of cases of epilepsy cured by surgical treatment.

Upon taking his medical degree, Dr. Billings became, in the fall of 1860, demonstrator of anatomy[1] in the

[1] The appointment is announced in an advertisement in a faded copy of the *Daily Times* newspaper of Cincinnati for Wednesday evening (Oct. 24, 1860), which reads as follows:

MEDICAL COLLEGE OF OHIO

The regular course of Lectures in this institution will commence October 22, 1860, and continue until the latter part of February, '61. Clinical Lectures at the Hospital will commence on the first of October and continue during the College term.

FACULTY:

Obstetrics and Diseases of Women and Children,
M. B. WRIGHT, M.D.

Surgery and Clinical Surgery,
GEORGE C. BLACKMAN, M.D.

Medical College of Ohio, which made his circumstances somewhat easier. He was also beginning to get in touch with surgical practice through the good offices of Professor Blackman, who the next year (1861) was already offering to take him in partnership as his assistant. Had this come to pass, Billings would no doubt have become one of the leading surgeons of Cincinnati and of the United States. But this was not to be. His fortunes and his career were abruptly veered into their true course by the event of the Civil War.

Practice of Medicine,
JAMES GRAHAM, M.D.

Anatomy,
M. W. DAWSON, M.D.

Physiology and Pathology,
J. F. HIBBERD, M.D.

Materia Medica,
J. C. REEVE, M.D.

Chemistry and Toxicology,
CHARLES O'LEARY, M.D.

Demonstrator,
JOHN S. BILLINGS, M.D.

Prosector to Prof. Surgery,
CHARLES THORNTON, M.D.

Professors' Tickets, including Hospital Ticket	$105
Matriculation Tickets	5
Demonstrators' Tickets	6
Graduation Fee	25

Good boarding from $3 to $5.

☞ Hospital advantages unsurpassed.

M. B. WRIGHT, M.D., Dean.

CHAPTER II

EXPERIENCES OF A MEDICAL OFFICER DURING THE CIVIL WAR

AT the outbreak of the War, Dr. Billings was still demonstrator of anatomy in the Medical College of Ohio, and was debating in his mind the question of going into a surgical partnership with his former preceptor, an opportunity which, in relation to his training in anatomy, opened out unusual chances of success and prosperity. When the crucial moment came, he was not found wanting. In September, 1861, he was invited to appear before the Examining Board for admission to the Medical Corps of the United States Army and some time later was given his examination,[1] passing first in the list of candidates. He was appointed First Lieutenant and Assistant Surgeon on April 16, 1862, and accepted the appointment on July 16th. As General Woodhull, one of his colleagues in the field, has well said:

> That was his offering, not to politics nor to sectionalism, but to the country. Those young men of 1861 who laid their professional gifts upon the military altar were no less patriotic than the other ingenuous youth whose immediate duty was combat with arms.[2]

[1] The examinations were delayed by lack of vacancies.

[2] General Alfred A. Woodhull, *Jour. Military Service Inst.*, Governor's Island, N. Y. H., 1913, liii., 329.

Billings's experiences at this examination and subsequently may be given in his own words:

In the Fall of 1861, I went to Washington to appear before the Medical Examining Board of the Regular Army. I had graduated from a medical college after a two years' course, each year having exactly the same lectures. I had had two years' hospital experience, and I had been demonstrator of anatomy for two years, so that while I had my doubts about my passing the ordeal of the Army Medical Board, from what I had heard of its severity, still I thought that probably I should get through. I came up before the Board, and at about noon of the second day I began to feel rather comfortable and thought I was getting on very well; but by noon of the third day there was a consultation between the examiners, and they began all over again, going back to anatomy and to the beginning of things. That went on for three days more and made me very uneasy. I did not learn the explanation of this until long afterward. When it was all over Dr. McLaren,[1] the President of the Board, said to me that he hoped I would take service at once with him—that he could not get my commission for some time, but that I could be made a contract surgeon without delay. I agreed to this, was introduced to Surgeon-General Finley,[2] got my contract, and was told that I was especially detailed to go to the Union Hotel Hospital in Georgetown, which was under the direction of Surgeon McLaren.

I began service, and had three things with me that none of the other surgeons had: A set of clinical thermometers like those Dr. Keen talked about, a straight one and one with a curve; a hypodermic syringe, and a Symes staff for urethral stricturotomy. The hypodermic syringe was in constant requisition. The clinical thermometer was troublesome and was not used very much. The Medical Director of the Army[3]

[1] Adam Neil McLaren (1805–74), medical officer, United States Army, 1833–74.

[2] Clement A. Finley, Surgeon-General, United States Army, 1861–2.

[3] Army of the Potomac.



JOHN SHAW BILLINGS
1863—ÆT. 25

was Dr. Charles S. Tripler,[1] who had seen me operate for stricture of the urethra the year before and thought the results were very good. Consequently whenever any surgeon of troops about Washington applied for the discharge of one of his men for the reason that he had an impermeable stricture of the urethra, instead of granting the discharge, Dr. Tripler sent that case to me. There was quite a number of them, but I have no statistics of my cases.

One day in the Spring of 1862 I was in the hospital office when two men walked in—one a large man with an air of importance, the other a small man who had said very little. The large man said they would like to see some of the cases in the hospital. They did not give their names, but I thought it was proper to show the cases, and so took them around. Practically I had done most of the operations in the hospital. After spending about two hours they went down to the desk and the big man said to me, "Dr. Billings, I wanted to see the man who beat my student Adams."[2] I told him I didn't know who "Adams" was. He said, "Don't you know the results of your examination?" I said, "No." He then said, "When you came up for examination they had finished their class, and the report was just ready to go in, when you were sent over with an order to be examined. They looked up your paper, found that you were born in Indiana, and thought they would make short business of it. At the end of the first day they concluded that probably you would pass, but hoped it would not be necessary to change the order of precedence in the roll, and that you could come in at the bottom. The second day they thought they would have to put your name higher up, and on the third day they concluded that you would be at the head of the class, but that, to be fair, they ought to ask you the same questions that they had asked Dr. Adams, who was previously the head of the class, and so they began all over again with you." I then learned that my callers were Dr.

[1] Charles S. Tripler, Medical Officer, United States Army, 1830–66; Medical Director, Army of the Potomac, 1861–2.

[2] Samuel Adams, Medical Officer, United States Army, 1862–7.

Hammond,[1] Surgeon-General, and Dr. Letterman,[2] Medical Director of the Army of the Potomac. Dr. Hammond said to me: "Day after to-morrow all the surgeons in this hospital will be relieved, which will leave you in charge. You will be sent some contract doctors, and you are to go to the cavalry barracks at Cliffburne, on the hill back of Georgetown, turn them into a hospital, and move this hospital out there as soon as possible."[3]

When Dr. Billings took charge of the Cliffburne Hospital,[4] which had been previously occupied by the Fifth United States Cavalry, he found the buildings and grounds "in an extremely filthy and dilapidated condition,—no drainage whatever, no sinks, no water within half a mile." He immediately set in motion some important sanitary reforms:

Five buildings, the old barracks, were first fitted up, additional doors and windows being inserted and the system of ridge ventilation adopted. Apertures were also cut in the sides of the buildings near the floor, and every part well whitewashed inside and out. A thorough system of drainage was instituted and three wells dug and fitted with large wooden pumps. These, however, were insufficient, and one team is in constant use bringing water from a distance. A new building for kitchen and mess-room was built, 200 feet in length and 15 in width, and Ball's patent range placed therein, capable, as found by experience, of cooking easily for 1000 persons. . . . One hundred and five hospital tents were pitched, framed and floored, and two additional buildings fitted up, making the

[1] William A. Hammond, Surgeon-General, United States Army, 1862–4.

[2] Jonathan Letterman, Surgeon, United States Army, 1849–64; Medical Director, Army of the Potomac, 1862–4.

[3] *Tr. Coll. Phys.*, Phila., 1905, 115–117.

[4] His assignment to this post is dated May 9, 1862. At that time he was stationed at Union Hospital, Georgetown, D. C. Dr. Billings was ordered to remove the patients and property at the latter hospital to Cliffburne Barracks.

number of beds in the hospital one thousand. A bath- and wash-room 50 feet in length was also built, and four tubs are in constant use. Three washing-machines are used in the wash-room—and both hot and cold water freely supplied. An apothecary shop, store-room, clothing-rooms, knapsack-room, dead-house, guard-house, stable, etc., were also fitted up. Fifteen Sisters of Charity are employed as nurses; they prepare all extra articles of diet. Of their services and conduct I can speak only in terms of the highest praise.[1]

In the autumn of 1861, Dr. Billings met in Georgetown, D. C., his future wife, Miss Kate M. Stevens, a daughter of Hon. Hester L. Stevens, a native of Rochester, New York, who settled in Pontiac, Michigan, became a prominent lawyer in his adopted State and represented its Fourth District in Congress in 1852, afterward taking up his residence in Washington, D. C., where he remained until his death, May 7, 1864. Dr. Billings and Miss Stevens were married in St. John's Church, Georgetown, on September 3, 1862. From his letters to her prior to this event, we gain some further sidelights upon his experiences at Cliffburne Hospital.

June, 1862. Funny world this is—great pity that people can't always see just where the joke comes in. An old fool has been persecuting me for half an hour with all sorts of questions just because he was once a schoolmate of mine at Oxford. Since then he has either risen or sunk to the dignity of reporter for the public press and is going round like a roaring lion "wanting to know" you know. How his eyes shone when he recognized me—he scented a victim afar off. The Secretary of the —— was out here to-day—a short, pursy, vulgar sort of man with an underdone face and oyster-like eyes and afraid of his wife like a good Christian and a gentleman—or any other man. I've just received an order to send off two hundred

[1] *Medical and Surgical History, War of the Rebellion*, Washington, 1888, Pt. iii., v. i., *Med. Hist.*, p. 910.

convalescents and the Hospital looks like a beehive just before swarming time. The chronic rheumatism men are turning out in high glee for they think they are going to where they will be discharged.

Victims of misplaced confidence
My heart bleeds for you! ! ! . . .

. . . There is an evil which I have seen under the sun and it is—to have one of the Hospital cooks steal half the ration of coffee issued and then be assailed by the unfortunate cripples with the news that their coffee tastes like dish water. Didn't I suppress the cook aforesaid however.

June 19. After I left you I went to Willard's, where I met all the fogies that I told you about, and then I came out home, found one of my stewards drunk, wound him up, and went to bed. Went to town this morning, got the Flag and am going to have the Marine Band; bought the New York *Times* of the 18th inst. where I found a notice of your humble servant, and came home. Found a letter here from Mother which you shall read when you come back—plenty of good things in it for you. Also found three letters wanting to know you know. Then I got some dinner and a poor dinner it was, and then I smoked a cigar and wondered what you were about. Then I signed my name 53 times—saw a number of visitors and looked about through the wards in a patronizing sort of way—and then it was supper time. After that I rode to town and saw Mrs. D—— who is now out of danger. Coming back Guy put his foot in a hole while at a full gallop and fell bringing his whole weight upon me. It hurt me pretty badly, and I should have fainted only there was nobody about to pick me up and I thought it wouldn't pay. My lately ascendant lucky star preserved me however and no bones were broken, all the result being a little bruised and somewhat frightened. I shall stay in bed all day to-morrow and that will prove an all sufficient panacea.

June 21, 1862. Crowds of visitors to-day—this being visiting day. . . . The roses are swinging lazily in the wind

out on the balcony and have a sort of Saturday night look about them which is very pleasant. One little bud has been nodding directly at me in a jocular sort of a way for the last ten minutes. I shall be aggravated into going out and picking it before long and if I do, I'll send it. I wish that my week's work was over though—Sunday don't bring much consolation, seeing that all visitors ruffle their plumes on that day. . . . I have received 17 official letters to-day and have come to the conclusion that the best way to manage them is to put them in pigeon holes and wait a day or two. I should like to mount Guy and ride in to see you to-night.

June 25, 1862. It is dark and sultry and great thick walls of silence are shutting me in; the roses on the balcony do not even quiver and even the moths flutter about but listlessly. My table is covered with letters, papers, and orders which have been accumulating all day, but I have pushed them all aside and secured a foot square of clear space for your benefit—or rather mine, for I am tired, my eyes are large, and I want to talk to you. . . . I do not think I shall be ordered off unless some change happens in the army before Richmond. . . .

June 28, 1862. I went down to Washington this morning and transacted a good deal of official shopping which is, I think, just as difficult and tiresome as your shopping can be, but succeeded very well and made the highly pleasing discovery that I am not to be ordered off yet a while. So I came back refreshed and went to work here, ordering everybody about in the most vigorous manner, and signing papers and letters like a whirlwind. Then the expected white envelope from Reading came in and was deliberately put away until I could enjoy it without interruption. So after dinner, I lit a cigar and strolled down into the woods, where no one would think of looking for me, and passed a pleasant hour. . . . The crowd of visitors who came out of merely idle or vulgar curiosity has become small by degrees and beautifully less, and I don't have so very much bother or trouble now in that respect.

July 1, 1862. I expect loads of wounded in a day or two but hope they will keep off till I get my accounts and papers made up.

July 2, 1862. Hurrah for me! I've got the muster rolls and pay accounts of my six hundred men all made out and sent in, and was informed that they were correct, also had a little malicious pleasure in being informed that most of the other hospital rolls were incorrect. . . . To-morrow morning I begin on my property accounts and then this abominable bookkeeping business will be done. And then I shall be as jolly as ever again and will be able to say from the bottom of my heart, what fun! Come stand behind my chair and look at a picture. Just on the other side of the table sits Dr. —— also writing a letter with his paper almost touching mine. He has a black velvet smoking cap on, beneath which his red face looms out like the moon in a foggy night—a rough coat on, no cravat—and the stump of a burned-out cigar between his teeth, altogether the most disreputable looking man I ever saw. He is (tell it not in Gath) writing a letter to Miss H. proposing to her to love, honour, and obey him for the rest of his natural life. He don't more than half want to do it, but after a long talk with me he has set to work. I caught a ghastly wink from him just now as I looked up. Altogether he reminds me very much of Sam Weller when he was writing his famous valentine. If you could only see his mouth, twisting and vacillating about the corners while he writes, you would laugh until you cried. I think he will be accepted—if so I hope it will change him very materially.

July 3. Have just got back from a visit to Washington where I got your letter which did me a world of good. I also got a Philadelphia *Enquirer* in which is the announcement of my confirmation by the Senate—another piece of good news. We have been defeated at Richmond I am very sorry to say, and the wounded will be pouring in here day after to-morrow. I must have a good night's sleep and get well braced up to be ready for them.

The last letter of this series relates to the operative work done upon the Union and Confederate wounded of the Seven Days before Richmond, an experience in which Dr. Billings was assisted by fifteen Sisters of Charity, who took charge of the nursing.

July 7, 1862. I catch a moment's breathing spell just to let you know that I am alive and that is all. I've received 200 wounded, and have been operating 24 hours steadily, shoulder joints and elbow joints, arms, legs, etc., etc.—glorious opportunity to acquire a reputation and surgical glory but to use C.'s pet phrase, I am nearly crapulated. Hot—well I should rather think it was—perfectly boiling. . . . Just as I had written thus far I was interrupted by the arrival of 125 more wounded and just as I was hard at work with them, lo and behold here come the Medical Director, Surgeon-General, Chief Inspector of Hospitals and 6 Surgeons—to see me operate. So I cut off an arm and cut out a shoulder joint for their benefit and they went away firmly convinced that I knew all about it. It is now 12 P.M. and I am so sleepy—I will write you one more letter to-morrow night and then will wait until Friday. Good-night.

Many years afterward, in describing his experience while on this duty, Dr. Billings expressed himself as follows:

One of the difficulties at Cliffburne was that we had a large number of Confederate as well as of Union wounded. The old residents of Georgetown and Washington were mostly in sympathy with the Confederates, and came out bringing good things to eat and drink, with the desire that these things should be for the exclusive use of the Confederates. On the other hand, the ladies of the families of members of Congress and of officers in the departments were enthusiastic for the Northern side, and they also came with various good things, but with the specification that none should go to the rebels. We would not receive gifts from either party on these terms, but after a

little explanation they were left to be used for those who needed them most.

I remember a member of Congress from New York City who came up and said: "You have got a lot of my boys here; I would like to do something for them, something that the papers will notice you know. What do you think I had better give them?" I said: "They have all got more or less scurvy, and I think fresh strawberries would do them good. You might have a strawberry festival, and have a band here."

He agreed and it was a great success, as the reporters duly proclaimed.[1]

Between August 29, 1862, and March 31, 1863,[2] Dr. Billings was on duty at the United States Army General Hospital at West Philadelphia, afterward called the Satterlee Hospital, of which he became executive officer. His marriage took place September 3d, a few days after his appointment there, and during part of his stay in Philadelphia, his wife resided in that city. This hospital was filled with thousands of sick or wounded soldiers and the

[1] *Tr. Coll. Phys.*, Phila., 1905, 117. The newspaper extract, from the New York *Times*, June 18, 1862, reads:

"A TREAT TO THE SICK AND WOUNDED

"The sick and wounded soldiers at the Cliffburne Hospital, including those from Shields's Division, who arrived here on Monday, were this evening, through the generosity of Mr. Wm. A. Bayley, of New York, treated to a profuse supply of strawberries and cream, under the superintendence of Surgeon Billings, of Cincinnati. This hospital, which is one of the largest, is made one of the most comfortable in the District. Surgeon Billings this afternoon performed upon one of the Ohio wounded a very delicate and dangerous operation, in a manner which elicited the commendation of all who witnessed it. Two wards of the Cliffburne Hospital are devoted to the Rebel wounded brought from Williamsburg. They are, in every respect, as well cared for as our own gallant volunteers."

[2] The official orders for these assignments are dated August 18, 1862, and March 20, 1863. It is improbable that he left Washington before September, owing to pouring in of the wounded from the Second Bull Run and Chantilly (August 29th–Sept. 1st).

duties of its executive officer were arduous. Here he no doubt acquired that ease and readiness in handling official business which was to serve him in such good stead with the Army of the Potomac in 1864 and in his subsequent career as a civil administrator. When he was ordered to the field with the Army of the Potomac, a document was drawn up by the staff of the hospital, begging Dr. Billings "to accept from us a saddle and bridle and full horse equipments, which we hope will be of service to him in the field, and will serve to remind him of the friendly feelings of his former associates."

A few paragraphs from letters to Mrs. Billings while she was in Washington relate to this period.

November 30, 1862. I have just got back from the city, where I remained all night with Dr. Hayes,[1] have disposed of a pile of papers and business which had accumulated. . . . I had a very pleasant time at the club. All were gentlemen distinguished in science and everyone did all he could to make it pleasant. Supper was choice, terrapin, oysters, croquets, salads, etc., and the wine was dry Verzernay and was unique—not to be bought in this country at any price whatever. . . . About 1 A.M. Dr. Hayes and myself went to his rooms, lit cigars, and got out his maps, chart, and MSS. and talked an hour or so altogether. I think I learned more yesterday than I ever did before on one day in my life. I have bought the microscope and last night had a talk with the two best microscopists in the United States, Drs. Leidy[2] and Lewis—and they are going to help and show me.

December 13, 1862. I'm up again you see and downstairs at my desk. I had a pretty hard time yesterday, for I had to lie in bed all day and all night. . . . They are filling up the hospitals with patients from Washington—getting ready there

[1] Isaac I. Hayes, United States Volunteers, the noted Arctic explorer.

[2] Joseph Leidy, the famous anatomist and naturalist, then a contract surgeon for hospital duty.

I suppose to receive the wounded from Fredericksburg—we received over three hundred yesterday. . . . My microscope is resting safe in its case and only waits your appearance to glisten most bravely.

On March 31, 1863, Dr. Billings reported for duty to Surgeon Jonathan Letterman,[1] Medical Director of the Army of the Potomac, who had achieved brilliant reputation by his effective work in the reorganization of the Medical Department of that army, including its ambulance and supply service. At this time, the Army of the Potomac was lying on the left bank of the Rappahannock River (Stafford County, Virginia), in wide-spread camps which it had occupied since the disastrous battle of Fredericksburg in the preceding December. The mass of the army was north and west of Falmouth, a village directly opposite Fredericksburg. Billings was immediately assigned to duty with the 11th United States Infantry, a part of the Second Brigade, Second Division (Sykes's), Fifth Corps (Meade's). General Hooker was in command of the Army of the Potomac, with which he was preparing to cross the Rappahannock above the mouth of the Rapidan, in order to attack Lee on the opposite side. The Rappahannock was crossed on April 28th–29th, the Rapidan on the 30th, and on May 2d–3d the battle of Chancellorsville was fought.

[1] Jonathan Letterman (1824–72), of Canonsburg, Pennsylvania, a graduate of Jefferson Medical College, Philadelphia (1849), became an Assistant Surgeon, United States Army, January 29, 1849, and, after making a highly creditable record, succeeded Surgeon Charles Tripler as Medical Director of the Army of the Potomac on June 19, 1862. He was relieved from this position at his own request in December, 1863, and, on December 22, 1864, he resigned from the Army to go into private practice. While it would be impossible to give any adequate account of the value of his services here, all agree that the splendid organization of the medical service of the Army of the Potomac in the field was largely due to him. For a good account of his work, see the memoir by Lieut.-Colonel B. A. Clements in *Jour. Mil. Service Inst.*, Governor's Island, N. Y. H., 1883, iv., 250–287.

EXTRACTS FROM PRIVATE LETTERS (APRIL 1–MAY 8, 1863)

[*With General Hooker's Army on the North Bank of the Rappahannock.*]

April 1. I am now ensconced in Dr. Ramsey's[1] tent, am patiently awaiting an assignment to some regiment; for when I got over here I found a regular surgeon with the 4th, and suppose I shall be ordered to the 12th but am not sure yet. Last night I had a board floor and a bed-sack full of hay to sleep on, so that I took it very luxuriously. Had a good breakfast, after that took a ride of about ten miles[2] and here I am.[3] . . . The sun is shining pleasantly but it is blowing great guns and the little tent rocks as if it was going to turn a somersault before long. . . . We have a man here who goes down to Washington every week and brings up all sorts of things for the officers, charging them 10 per cent. commission, and in that way most of the officers' messes here are kept pretty well supplied. Of course on the march they have to fall back on hard bread and bacon, but just now they live in very good style. I have just learned that furloughs are being granted for fifteen days, which is a good proof that we shall not advance for that time.

April 3. I have not yet been assigned to duty and am still staying with Ramsey, and don't feel very well, having caught a very bad cold, and not being able to speak above a whisper. My horse has also become very sick—out of sympathy I suppose—and cannot eat anything. I have been working a little with the microscope and find that it answers its ends very well—have been walking about, exploring the country, and reading some novels in the interim. . . . I went out last night and sat on the edge of a high bluff which overlooks the

[1] William R. Ramsey, Medical Officer, United States Army, 1861–8.

[2] From Aquia Landing.

[3] This division was probably lying a mile or two south of Potomac Creek, which here runs nearly parallel to and about ten miles north of the Rappahannock.

valley of Potomac Creek, the moon shone coldly down from between masses of black clouds—not a house or fence in sight—nothing but silence and desolation. The country looks as if the shadow of the wings of Azrael were resting on it—a horrible dream of death. I received a letter from Mother yesterday—she has not heard of our Hegira and talked of making us a visit.

April 6. I have been down with bronchitis, but am up again this morning as large as life. Night before last it snowed and blew and rained and froze until I thought the whole camp would be carried away. Ramsey and I had to have an extra guy-rope put on our tent to keep it from being blown away, and I lay in bed and grumbled until I went to sleep. I have been assigned to the 11th Infantry with Ramsey but I suppose he will be ordered away before long.

April 7. The President and suite reviewed our division this afternoon but I did not feel well enough to go out as I am only just getting over my cold and had a very severe headache. . . . I am going to ride over to General Hooker's headquarters to-morrow, if it is pleasant and I feel well enough. . . . I am still tenting with Ramsey and am attending to the sick of the 11th Infantry, but it does not take me much over an hour a day and the rest of the time drags rather heavily. My microscope assists me somewhat however and the arrival of the daily New York papers forms an era in the day. We have a great deal of music about here—as you may well suppose—every regiment has a band and some of the officers play on violins, guitars, etc. Yesterday an interlude occurred by a man's having his head shaved and being drummed out of camp. I could not help thinking of my Philadelphia experience on that point.

April 8. The whole division has gone off about 3 miles for a grand review which will last about all day and I am left on the sick list. I have just heard some consoling news from Dr. Helsby[1]—he says he was here one whole month before he got a

[1] Thomas H. Helsby, Medical Officer, United States Army, 1861–5.

letter from his wife, who lives in Baltimore, and then he got 14 at once. . . . Richard has done very well so far,—he blacks my boots, brushes my clothes, takes care of my horse, did some washing for me yesterday, and has just been plastering up my chimney with mud to keep it from catching on fire—altogether he is a very good man Friday. It will cost me about sixty or seventy dollars a month to live here, for everything is exactly double what it is anywhere else. . . . The Commissary supplies us with fresh bread four times a week and there is very good butter at the sutler's, so that we are faring sumptuously. . . . Privacy is a thing that is never heard or dreamed of out here—you can't keep your tent curtain shut ten minutes without having somebody pop their head in and nobody seems willing to be alone any longer than he can help. So you see I have no chance to indulge in one of my sulky fits out here and perhaps I shall get cured of them before I come back.

April 10. I rode over to General Hooker's headquarters yesterday and saw Dr. McGill.[1] I caught a fresh cold and was very sick last night but feel better this morning. I received an order last night putting me on a board for the examination of such volunteer surgeons as may be sent before the board, to see whether they are qualified for the posts they hold. It will occupy me about a week and about 4 hours a day. Ramsey and I get along very well together and I consider myself quite fortunate. . . . I think if the army is going to move at all that it will do so about the 20th of this month, but I should not wonder if it remained inactive until the fate of Charleston, Vicksburg and Rosecrans is decided. The weather is warm and pleasant, the roads are very good and altogether it feels very comfortable. My horse is very much admired, and Richard began to make himself famous yesterday by knocking a man down who was twice as big as himself because he tried to take away some of my forage.

April 12. I have just finished my morning sick call and having a few moments to spare before going out on a review

[1] George M. McGill, Medical Officer, United States Army, 1862–7.

I will devote them to you. . . . I was on the examining board all day yesterday and we finished two poor young sawbones, rejecting both. One of them gave his name as George W. B. and when I asked him what the W. stood for he said he did not know exactly but thought finally that it might be Washington. Dr. Craig[1] the Chief Surgeon of the Division received the acceptance of his resignation yesterday and presented me with his sword last night, one which he has carried for 7 years. It came in very handy to me as I had left mine at home. By his resignation, Ramsey is again Surgeon-in-Chief of the Division. . . . Review is over, my toggery is out of the road, dinner has been disposed of and I have just time to scribble a little before the mail closes. It has begun to rain—not violently, but a warm, genial spring rain—and I am alone in my glory. A sentinel is pacing up and down in front of my tent and by his side a man carrying a thirty-pound log of wood which he is condemned to carry every alternate two hours for twenty-four hours as a punishment for some offence he has committed. My horse was universally praised and admired this morning and, by the way, he is called Dick by everybody.

April 13. All the cavalry passed by here this morning on their way across the river, also some artillery, and but very few days can elapse now before something happens. I have been busy all day in getting rid of my lame ducks, discharging some and getting others off to General Hospital so that I may have as few to commence with as possible. The day has been pleasant but a cold mist is creeping up over everything to-night and I have to stay indoors pretty closely. . . . I wish I could sit down to a West Philadelphia Hospital dinner again to-morrow—I am beginning to turn away from my food.

April 15. It has been raining heavily all the morning and is now pouring like a second Deluge. . . . It was anticipated that we should move forth in battle array this morning, so last night all the officers met in what is called the protracted meeting of the night before battle. I went over and certainly

[1] Robert O. Craig, Medical Officer, United States Army, 1856–63.

it was a scene which was new to me. In a tent just the size of ours were fourteen officers from the commander of the regiment to lieutenant, brandy circulating freely with crackers, sardines, pickles and Spanish olives. I was welcomed with a shout and the company then proceeded to sing the Year of Jubilo in full chorus. Then came comic recitations, stories and songs of all descriptions, from *Annie Laurie* to the *Sentimental Coon*. And so it went until the small hours with jest and song and wound up with the battle song of which the chorus is:

"Then stand to your glasses steady,
We drink to our comrades' eyes,
One cup to the dead already
And Hurrah for the next who dies."

But it was all sentiment thrown away for we did not march and shall not for two or three days. Dr. Clinton Wagner[1] took charge of the Division yesterday—a very pleasant agreeable sort of fellow—and Ramsey is now back on duty with me. I have finished my labours on the Board of Examination and have little or nothing to do now but smoke and sleep. Ramsey and I have bought an old pack horse and we propose to carry our worldly goods thereon.

April 17. The Dr. (Ramsey) and myself have established a mess with Major Floyd-Jones[2] who is now commanding the regiment—he has a very nice little mess chest and I think we can be very comfortable. . . . We have just been counting up our supply of provisions for the march, which must last eight days—they are as follows: 3½ lbs. dried beef, 8 lbs. boiled ham, 6 lbs. soft bread, 21 lbs. hard crackers, 4 lbs. cheese, 2 dried tongues. Do you think that will last us? . . . I have been detailed as one of the operators of this Division in the coming battle, so that I shall be at least 1000 yards in the rear.

April 18. I have just returned from a long ride down to the river opposite Fredericksburg and from thence up the river

[1] Clinton Wagner, Medical Officer, United States Army, 1860–69.
[2] De Lancey Floyd-Jones, Officer, United States Army, 1846–1902.

two or three miles and then across country to my den again. I took a very good look at the Rebel redoubts and entrenchments—saw the Rebel pickets lying on the grass smoking and chatting and was within easy rifle shot. The weather was pleasant and my horse fairly danced with glee. This morning this Division was reviewed by Genl. Meade and I rode on the brigade staff. . . . We see no further signs of a move but it cannot be delayed much longer—the roads are in elegant condition, as hard and smooth as a floor and everybody is spoiling to do something. . . . I've got pretty well acquainted with the ways and means of living down here and shall soon be able to rough it with the best of them.

April 19. We are still resting peacefully on the hillside and it is Sunday night and all's well. All sorts of rumours are flying about—the capture of Suffolk, the arrival of Lincoln, Stanton and Co. for purposes of consultation, Hooker having broken his leg, his having gone to Washington, etc., etc., all of which I listen to placidly. . . . We had a small accident tonight in the explosion of one of the caissons of Weed's Battery whereby five men were burned and bruised. I was immediately put in charge of the wounded and that gave me something to think about for an hour or so. Dr. Ramsey went down to Aquia Creek to send some sick on to Washington and has not yet returned. When he does come I think he will bring some fresh shad which will be as welcome to us as the flowers in May. . . . You would be amused if you could see the style of my washing which Richard always brings back the day he gets it. The ironing is done with a large axe. . . . I have considerable desire to try some surgical operations once more and see whether my right hand has forgotten its cunning. I don't think I shall make any mistakes however. I will put this letter away now for the Philistines are upon me.

April 20. A whole regiment went off this morning on picket duty and only four or five officers and a few men are left to guard the camp. I have been ordered to go to Corps Headquarters this morning and resume my place on the Examining

Board. It is about one mile and not a very pleasant ride. . . . I have just returned, wet and cold, when [Nos.] 9 and 10 of your letters were handed me.

April 22. "Ah fine it was that April time, when summer winds were blowing,
To hunt for pale arbutus blooms that hide beneath the leaves,"
and so I send you some arbutus plucked from the hills of the Old Dominion to keep you from forgetting. The regiment is all out on picket and the camp is silent and solitary. Ramsey is busy over quartermaster papers and I am smoking my pet pipe in great dignity and comfort. Yesterday I took a ride of about five miles through mud and brush, going down to the Corps Hospital. There is no news of any kind except a rumour that J. C. Frémont is to supersede Hooker. . . . Everything is so dead and stifling. The principal events are breakfast and dinner, as we live in fashionable style and have but two meals a day. . . . Looking out of a slit in the back of the tent which answers the purpose of a window, I see two balloons up, one over Hooker's headquarters. I should like to make an ascent in one of them, although practically they are esteemed of but little use. . . . I am going out now for a ride to the picket line with Ramsey and Wagner.

April 23. Last night I posted off an answer to your No. 11 and after that it began to rain in torrents and kept it up until twelve M. to-day, so that everything is afloat again and there is no chance of a move for three or four days. . . . The men have just come in and a more miserable bedraggled set you never saw. . . . When it is pleasant weather I can get along very well by taking a long ride or walk, but these rainy days bring tedious hours sometimes.

April 24. Windy, cold and blustering this morning—very good weather for drying up the roads. Ramsey is snoozing peacefully under his buffalo robe—while I with my pet pipe am waiting for breakfast. The officers of the Eleventh made a

gigantic bucket of hot punch last night to keep the cold and wet from striking in as they said, and I drank too much, consequently feel like a boiled owl this morning. . . . I suppose we shall go in two days more if it does not rain again.

April 25. Last night I went over to Hooker's headquarters with Ramsey. When we started to come back the moon was shining brightly and we thought we were going to have a very pleasant ride, but before we had got half a mile it was as dark as Erebus and raining furiously. We let our horses take their own way and they brought us out safely at last. To-day I took another ride of eight miles and feel as stupid as possible. . . . As to the movements of the Army, they are out of the reach of prophecy.

April 26. The day is sunny and pleasant but rather windy, and being Sunday, the usual inspections and reviews are going on. I hear Richard growling outside, because somebody has stolen Dick's forage, and the tramp, tramp of the men as they are filing by for inspection. . . . Every corps in the Army has its peculiar badge, some a star, another a crescent, etc., ours is a Maltese cross and every officer and soldier has to wear one. I had a very pretty plain silver cross presented to me last night by Dr. Hichborn,[1] which I fastened to my hat. . . . The newspapers have been very jubilant in tone lately, and I am glad to see that the spring campaign is opening so prosperously. I think our military wiseacres are a little puzzled however as to what they had better do with the Army of the Potomac. At least I see no other reason for the delay. My only prayer just now is that this pleasant weather may continue. . . . We are losing men very fast now from the Army, by the mustering out of the 9 months' and 2 years' regiments, and by another month I suppose the 20,000 men will have gone home. Our pioneers are out to-day building bridges on the roads leading to the Upper Fords but everything else seems to be asleep—not even dreaming. Nobody about here gives any

[1] Alexander Hichborn, Acting Assistant Surgeon, United States Army, killed at Chancellorsville, May 3, 1863.

opinion of any kind upon the past or the future of the war, and that is what I like. I believe in officers and men doing precisely what they are told to do without asking any questions or making any comments. It is very easy to criticize past mistakes, very hard to foresee future difficulties. Any man who is so carried away as to be able to see no good whatever in any particular party is in my opinion a fool, and any man who thinks that two years hence his judgment of men and deeds will be the same is an ass. . . . I myself believe in the thought of Hume, as expressed by Carlyle, that the world is merely a great fair with the booths and puppet shows of which it is not worth while to quarrel, for we shall be done with them soon. I hope that in the great Hereafter there will be no Congressmen nor men who are bought with a price, but I don't know. I think it would be very hard to make thoroughbred gentlemen out of them without changing their personalities, but I must not limit Omnipotence of course.

[April 28–29. *Crossing the Rappahannock.*]

Near Hartwood Church, Va.

April 28. I am writing this seated on the ground by the bivouac fire with my haversack on my knees for a desk and can write but little, for my only chance to send letters now is by officers going to the railroad and one is going in half an hour. We broke camp and moved yesterday about 10 A.M., marching 8 miles, and are now near Hartwood Church on the Warrenton road. The Eleventh and Twelfth Corps have been filing past us all the morning—as soon as they are out of the road we shall move again but where I do not know. We have no wagons or ambulances with us and have to carry our own food and our horses' for five days with our bedding, etc., which makes a pretty heavy load. . . . I feel very well and like the march better than the camp, but it is going to rain hard in two or three hours and that will not be so pleasant.

April 30. Somewhere in Virginia. I begin to scrawl to you now, although I don't know when I shall finish it or when I shall have a chance to send it. I am sitting at the foot of a big

tree resting till the pioneers can make a fire and get us some supper. We are near Chancellorsville—about 12 miles from Fredericksburg. I rode back from Tuesday's camp and met Ramsey and then we made a double quick march and caught up with the Regiment just at dark. I rode 38 miles that day and was very tired. We crossed the Rappahannock at Kelly's Ford and then made a forced march across the Rapidan, which we crossed at 10 P.M., the water being waist deep. On this march we had to send back all extra horses—and Richard with the pack-horse. So I have had nothing to eat since yesterday morning except two hard crackers and one slice of bread. Dick has had nothing to eat for the same time. Richard has just come with the pack-horse and we shall have something to eat before long. I have sent two men off with orders to steal some forage and not show their faces until they found it, so we shall be all right. Last night our Regiment bivouacked in the mud on the banks of the Rapidan. We had no tents or blankets and it rained in a jolly manner. I am telling you the exact truth when I say that this morning I poured a quart of water out of each boot. To-day we have marched about fifteen miles, captured about 100 prisoners, had a small skirmish, and are now resting in anticipation of a good solid fight to-morrow. Crossing the Rapidan was the most ridiculous sight I ever saw. Fancy 30,000 men stripped to the waist and wading about in a misty moonlight. I feel very well, only a little tired and to-night's sleep will set that all right. I got my instruments out of the box that Ramsey brought. The rest I am afraid is gone for I had to put it into a wagon and the Lord only knows where that is. When I get another chance I will write some more and send this off, but I don't know when it will be.

[May 1–3. *Battle of Chancellorsville.*]

May 2. Yesterday morning we marched out from Chancellorsville and met the Rebs in about two miles. The fight was pretty sharp for an hour or two, when we fell back, having lost about 100 men and three officers out of the Division. The

shell fell pretty thick around me at first but that soon stopped and I went to operating. When we fell back I narrowly escaped being captured, but got back to a large brick house at the cross-roads which had formerly been a hotel and then occupied by Hooker's headquarters. There the Hospital was established and I operated until late in the night. This morning we have fallen back one mile further and are now lying on the road to United States Ford, about three miles from the river, behind a breastwork of trees and expecting an attack any moment. They are now firing heavily on our right, I hope it will come out all right.

Long afterwards Dr. Billings described his experiences at this battle as follows:

At the battle of Chancellorsville there was a good deal of joking among some of our line officers about the doctors not getting up to the front, that they kept in a comfortable place about a mile back, etc. This was mostly chaff, but there was a little bit of earnest in it; so I said I would go up and see. The regiment came under fire, and was then less than 200 yards from the Confederates, and I was, perhaps, 40 yards behind the firing line. I stopped behind a little frame house, giving notice to bring the wounded there. I soon found that the wounded who could walk would not stop where I was—it was entirely too close. At first the men that were more severely hit were brought back by members of the band, but very soon there were no more bandmen, and they never came back for a second load. When the men began to bring their wounded fellow soldiers in they would not stop where I was. Finally a shell went through this wooden shanty, making a deuce of a clatter, and that settled the question of the men stopping. The slightly wounded men would not stop, and the bearers of the badly wounded men would not stop, so I moved back about 200 yards and began to work there, but soon got an order from the medical director saying that I was still too close, and must go back to the Chancellor House about a mile away and establish my hospital there. The next morning the

Chancellor House came under artillery fire and I had to move again. Fortunately I was able to get all the wounded out of the house and to move them back another mile or so into a little hollow without losing any of them. But one of my assistants was killed.

My experience in Chancellorsville was that of handling wounded without an ambulance corps, and getting them off when the troops were falling back. It is one thing to provide for wounded when the troops are advancing and leaving the hospital behind, and quite another thing to fall back with your wounded when the troops are retreating.[1]

LETTERS TO MRS. BILLINGS

May 4, 8 A.M. I am sitting on a stretcher in a little hollow about 500 yards behind our lines, a position which we selected yesterday morning for a Division Hospital. Night before last we marched and fought nearly all night and the battle was pretty sharp yesterday until 4 P.M. I operated all day yesterday and expect to do the same to-day. Last night Richard confiscated a bag of oats and a box of hard bread and I got some blankets so that I was quite comfortable and feel very well to-day. Shell fell all around us but none lit in the hollow and I hope none will. The Hospital I was in before has been shelled and burnt to the ground. I suppose to-day will be the hardest fight of all, if it be true that the Sixth Corps is coming up from Fredericksburg. . . . None of our friends have been hurt yet.

May 4, 1 P.M. No fight yet but we are expecting something pretty warm. . . . We have not succeeded yet and are in rather a tight place.

May 5, 5 P.M. Second Division Hospital near United States Ford. A heavy thunder-storm has just passed over us and has very nearly washed us off the little side hill on which we are camped. I am now surgeon in charge of the Hospital

[1] *Tr. Coll. Phys.*, Phila., 1905, p. 118.

and it keeps me pretty busy. There has been but little fighting to-day and the impression seems to be that we shall fall back to-morrow but I put no faith in rumours. However I have made all arrangements, have sent all my wounded over the river and have got all the stores out of the way that I could. The lines at present run about 600 yards from the Hospital. If there is a retreat, our Corps will cover the rear and I shall remain until my Division goes by. I suppose you have been very anxious and uneasy for the last three or four days but you may rest perfectly contented, for I am sure to come out all right. . . . Dick stands at my shoulder, saddled and bridled, and my cook has just come to ask me—Where would the doctor have his supper? Dr. Hichborn has been taken prisoner—he was captured at my 2nd Hospital—a large brick house which was shelled and burnt by the Rebs and from which I was fortunately absent.

May 7. Here we are again—just where we started from—and I am seated at my old table to tell you about it. At 4 o'clock yesterday morning we started on the retreat, our Corps and Division being last and the whole Army was across the river at United States Ford by 10 A.M. No accidents occurred and there was no fighting except some shell firing at Banks' Ford. We left all our medical stores with Dr. Bacon[1] and a steward behind in the Hospital and I suppose they are all grabbed by this time. What we are to do next is hard to say. The roads are in very bad condition—it having rained for two days and is still at it, the river is much swollen—one of our three pontoon bridges having broken away—the men are wet, tired—and many of them have lost their knapsacks and clothing—and the officers are gloomy and dispirited. My own health is very good, although I had to sleep in a wet blanket all night and was thoroughly chilled when I awoke. I hope the Purveyor will be down to-morrow with something for us to eat for I don't like hard bread more than a week at a time and it is now 10 days since I have had anything to eat that was decent. I hear however that we are to move somewhere

[1] Cyrus Bacon, Medical Officer, United States Army, 1862–81.

to-night—but it is a mere rumour—at all events we can't go very far.

May 8. You will have read of course that we retreated—the Eleventh Corps, formerly Sigel's, was entirely routed and skedaddled in a most disgraceful manner, and has not rallied yet. We lost altogether between ten and fifteen thousand men, and our cavalry is still in danger, being not yet across the river. We are all packed and under marching orders but I do not think it possible for us to move for two weeks with any sort of efficiency. . . . I have charge of the sick of two regiments now, Dr. Hichborn not having yet returned, and so have a little more to do than usual. I have not had a chance to see a newspaper yet, but I suppose they have some curious stories in them—none of which you need believe. I like fighting tolerably well, although it is not half so exciting as I had supposed it would be—marching and bivouacking also are not so very disagreeable when the weather is pleasant and the roads tolerably good but when it is raining steadily—mud four inches deep everywhere—and nothing to eat for yourself or horse, then I object and begin to feel demoralized. . . . After all a big battle is a humbug—it takes 10,000 bullets to kill a man. I will not conceal from you that I feel disgusted and that I am utterly hopeless as far as regards taking Richmond or beating Lee with our present troops and generals. No one here expects to do it—not that there is any discontent or demoralization—but simply that if a battle were expected to-morrow, we should calculate on a retreat as a matter of course. I suppose we shall have a new General-in-Chief here before long but that will not make it any better in my opinion. The Rebs are better and braver soldiers than the men of this Army, and are under far better discipline.

May 10, 1863. We expect to move every moment now and I will just pencil off a few words to tell you that we are prospering about as well as could be expected. . . . Our great trouble just now is that we can get nothing to eat except hard bread and coffee, and none of us have any money, as we cannot

get our pay rolls cashed. I suppose we shall move to-morrow morning although it is impossible to say with certainty, nor can any probable conjecture be formed as to which way we shall go. They are afraid to allow any New York papers to come down to the Army, so that I am entirely in the dark as regards news but I suppose Hooker is condemned all round. It is a hot, sultry day and we are all keeping as quiet as possible, saving ourselves for the march and fight, or for an indefinite period of loafing as the case may be.

May 12. We are still quiet in camp with no news except that of the death of Stonewall Jackson. I have had a bower of evergreens built over my tent to keep out sun and dust and have made arrangements to stay here a month at least. Nobody knows when or where we move, so that I might as well be as comfortable as not.

TO GENERAL STEVENS

May 12. It is excessively hot and sultry and our camp was moved yesterday to the middle of a white dusty plain—not a tree or blade of grass being within half a mile—so that we get full benefit of the glare. Dysentery has made its appearance among the men and I suppose will become worse as the heat increases. You have read all about our little fight I suppose so I will not enlarge upon that subject. As to the present condition of the Army, it is very good—not much confidence in Gen'l Hooker but then there never was much of that in this Division, to judge from what I have seen and heard. Everything is perfectly quiet now—no signs of a move anywhere that I know of—the nine months' and two years' reg'ts are dropping out every day and taking up the line of march for home, and the others are arranging and decorating their camps as if for a month's stay at least. . . . Camp life introduces some new luxuries to a man's notice—for example, there is most exquisite enjoyment in getting your sore, hot, swollen feet into cool water after a long day's ride, and no nectar was ever enjoyed more than a cup of muddy soldier's coffee after a

night's sleep in wet blankets. When you succeed in getting your boots blacked and a clean paper collar on, you experience all the delight felt by a New York belle with a new ball dress from Stewart's, and any newspaper is enjoyed as much as a costly library. Of mental enjoyment there is little or none—altogether the life is beastly to the last degree—yet by no means unpleasant to a man who derives his pleasure from physical sources. My old cadet, Mr. Curtis,[1] writes me that he has received a position in the Surgeon-General's Office and that I am to be translated to the same Elysium before a great while.

TO MRS. BILLINGS

May 13. The sky is all clouded over now and the rain is beginning to fall gently on the hot and dusty ground, the air is cool and everybody feels better and in a better humour. It is about 5 P.M. Most of the officers are enjoying their dinners, or their pipes if they have dined. Our mess, consisting of Maj. Jones, Dr. Ramsey and myself, takes three meals a day and our supper will not be ready for an hour. . . . Our tent is arranged on a different plan from that which I sent you—the fly of the tent is pitched in front of the tent and under it is our wash-stand and chairs—or rather boxes—for we have no chairs now—the beds are on opposite sides of the tent—feet toward the door and between the heads of the beds is a small stand made of a box cover, on which stand the little microscope and other little traps and notions. Over the whole tent and fly a sort of bower has been built of pine boughs—altogether it is much the most comfortable arrangement we have had yet. My right-hand man now is a little drummer boy named Hawley who keeps me in as good order as he can. . . . I think I shall be relieved from this Reg't before long and assigned to the 7th but I know nothing certain yet. . . . I applied for 48 hours' leave yesterday, hoping to be able to give you a surprise, but failed in obtaining it—however it was just as I expected.

[1] Edward Curtis, Medical Cadet, 1862–3, Medical Officer, United States Army, 1864–71.

May 14. I learn that Dr. Hichborn[1] was killed at the brick house a little while after I left him. Poor fellow, I must write a letter to his ladye—he was to have been married in a month.

May 16. I have been relieved from duty with the Eleventh and sent to the 7th to fill Dr. Hichborn's place. . . . The weather has been exceedingly pleasant the last two or three days and I have been feeling very well physically, better than for a year back. I have been riding about, playing chess, at which I can beat everybody, reading *The Old Curiosity Shop*, etc., etc. They have no tent or sleeping-place for me at the 7th yet so I am still staying with Ramsey, and very likely shall mess here even after I move. Our mess has improved wonderfully lately—hot biscuits, eggs, roast beef, good butter, mashed potatoes, tomatoes, custard pie are the order of the day now and I believe I am going to get fat—how will you like that? We are not crossing the river again and I see very little sign that we shall do so—they seem to be inclined to make an army of observation out of us. The Officers and Doctors who are coming from the other side of the river say that Lee at no time had more than 40,000 men opposed to us.

May 20. The days still drag their weary monotonous way along as usual—nothing to do but to keep out of the sun and no news of any kind. I am fairly settled in the 7th now—have a tent to myself and am going it alone in every sense of the word, except that I still mess with Ramsey because I have no mess arrangements of my own; but I am going to procure them as soon as possible. . . . I have no associates at all now except Lieut. Curtis of this Regiment and I think I like it best so. I found a *Harper's Monthly* for May to-day, which is the first readable thing I have found since we came back and never was that miserable magazine more thoroughly enjoyed, I am certain. I think we shall not move for some time now although what good we can do by staying here is not known to me. The Western Army seems to be the active one for the coming summer.

[1] See footnote, April 26.

May 21. I have just received an order relieving me from duty with the 7th and putting me in charge of the Corps Hospital, but it is merely temporary in all probability. My leave went through all right but is of course stopped now—I shall get it some time next week probably unless something new turns up. . . . I make this a short note as I am in a hurry to pack up and be off.

May 28. I got here last night all safe with boxes and bundles, found Nell waiting at the Depot with Dick, and an ambulance for the baggage—jumped upon Dick, who snorted and jumped and galloped off in great exultation and got here in a very short space of time. Hardly anybody knew me—with my whiskers gone and a straw hat on—and I was introduced to one officer before he could recollect me. . . . I now have charge of the 7th and 10th Infantry which lie together and am more comfortably situated than I have ever been yet. . . . Our cavalry have moved out again toward the picket line—whether they will pick a quarrel for us to go up and settle or not I don't know.

May 30. I have just returned from a long, hot and very dusty ride down to Aquia Creek. . . . We are under marching orders again but no one seems to think that it amounts to anything—it is probably precautionary against Lee's trying to cross the river.

May 31. A storm of dust has been blowing all day and everything is covered with it—it is almost impossible to go two hundred yards in any direction and drill or inspection is out of the question. I have taken to getting up early and having sick call before breakfast now, for it gets too hot by 8 o'clock now to be comfortable.

June 2. The wail of a funeral march comes to my ears this sunny June morning—it is that of Lieut. Smedberg[1] of the 14th Infantry who died after 12 hours' illness. Dr. Whitting-

[1] Charles G. Smedberg, Lieutenant 14th United States Infantry.

ham[1]—one of my class—was very sick last night—had congestion of the brain, but is better now. . . . I am messing now with Dr. Helsby and others of the 6th Infantry and like it very well. Our marching orders are discontinued so that we are lounging about again as usual. . . . I am detailed to go out on picket to-morrow morning to be absent three days, so that you must be content to wait for a letter until I get back.

On June 3, 1863, Lee's Army began its northward movement toward Maryland and Pennsylvania, crossing the Potomac on the 24th and approaching Chambersburg on the 27th. Hooker crossed at Edwards's Ferry shortly after (June 26th–27th) and, being out of accord with Halleck, he was relieved at his own request on June 27th, and was succeeded by General Meade.

About the middle of June [says Dr. Billings], the 2d Division of the Fifth Corps took up its line of march, which, passing successively through Benson's Mills, Catlett's Station, Manassas, Centreville, Gum Spring, Aldie Gap, Leesburg, Edwards's Ferry, and Frederick, terminated, so far as I was concerned, at Gettysburg, Pennsylvania, on the morning of the 2d of July.

We may follow his life in the field up to the battle of Gettysburg in his letters to his wife.

June 4. Last night I went to bed in a quiet, peaceable way about 11 o'clock, and at one this morning I was roused by Capt. Martin,[2] who walked in saying, "Hello, Medico—stir yourself—marching orders have come and the assembly will sound in an hour." Up I scrambled and the energy and velocity with which I flew about when I got fairly awake was prodigious. I packed up all my goods—also the hospital stores and medicine—struck the tents—packed my two wagons,

[1] Edward T. Whittingham, Medical Officer, United States Army, 1862–3.
[2] James P. Martin, Officer, United States Army, 1860–95.

got a hot breakfast, got food for two days packed in my haversack, secured an ambulance all to myself by a little diplomacy, and when the assembly sounded I was seated on Dick smoking a cigar and placidly contemplating the universal rush and confusion around me. Fortunately I did not go out on picket as I thought I should, for just as I was all ready, an order came relieving me and ordering me on duty as President of a Board for the examination of sick officers. We are now camped near the Rappahannock, between Banks' Ford and United States Ford and are close to the Rebs who are in pretty strong force I hear. The whole 5th Corps is up here and holds a line 18 miles long, nearly. Whether we shall stay here over night or not is unknown to the subscriber, but I have fixed myself up in the most comfortable manner, as if I expected to spend the remainder of my natural life in this immediate neighbourhood. My tent is pitched under some large pine trees, my bed is made of pine boughs and is as soft and springy as a bed can be. A big box of medicines serves me for a table, my books are on it, my slippers on my feet, and altogether I am as jolly as a clam, the only drawback being that hard bread is the order of the day and eggs, milk, etc., have become mere reminiscences. Like Mark Tapley, Nell has come out strong under difficulties —he has hacked and hewed and shovelled and swept, and displayed universal genius. The prevailing idea here seems to be that Gen. Lee is going to walk into us some fine morning and cause the grandest row on record, but the latest reports say that Hooker's countenance is beaming and I think we shall worry through the summer somehow.

June 6. Camp near Benson's Mills, Va. Not a breath of fresh air stirs these sultry pine forests, but then dust is unknown and that is some consolation. We are lying here under marching and fighting orders and guarding the fords of the river and waiting, Micawber like, for something to turn up. Yesterday afternoon there was heavy firing for an hour on our left, but everything is perfectly quiet to-day and there are no rumours or reports of any kind. I walked about a little since I came here, found a few strawberries and a great many

wild flowers—I will send you a sample of the last. Also discovered a horribly ugly old woman who offered to sell a quart of milk for 25 cents and 6 eggs for half a dollar so that I suppose those are the market prices in this section of the country. . . . I have three sick men to attend to now, requiring about 15 minutes a day—the rest of the time I smoke and read chemistry, as I have nothing else to read. I feel stronger and healthier now than I have for a long time and if we have a little marching and fighting to do so that I can have some good hard work for a week or so, I think I should be very nearly perfect, as far as that is concerned. Lizards and large black spiders abound here, and there are a few rattlesnakes but I have not seen any of the latter yet. Notice has just been handed about that the commissary wagons are in and that ham, coffee, sugar, potatoes, and hard bread are obtainable and there is hurrying to and fro of cooks and servants and general rejoicings at the prospect of a good supper. I suppose that we shall remain here for some time to come, and have had a bower built around my tent and all the necessary arrangements made. I am fast learning how to extract a great deal of comfort out of very little material. . . . I should not be surprised if we were all inside the defences of Washington next month.

June 7. We are all on the *qui vive* here now and expect to be off on our travels every hour. We know that part of our troops hold Fredericksburg, and we have been packed up and all ready for a sudden start ever since last night. But the Sunday has gone by peacefully thus far and the shadows of the pine trees are beginning to fall a long way to the East, so that I suppose we shall have one more quiet night at all events. It is getting to be quite cold here in the mornings and evenings and an extra blanket felt very comfortable last night. . . . I have just received an order appointing me surgeon in charge and chief operator for the Division Hospital in the event of a battle. I only hope that my assistants will have better luck this time than they did last. You would laugh to see Nell making his preparations for the coming march. He has my

keys and packs and arranges my valises to suit himself. In one of my haversacks he has stowed a lot of crackers, Bologna sausage, a cube of boiled ham, a small bag of coffee and sugar mixed, and two boxes of sardines; in the other haversack is my comb, brush, etc., 6 paper collars, one pair of socks, 6 handkerchiefs, 1 towel, one piece of soap, 30 cigars, 1 corkscrew, 1 travelling ink stand, knife, fork, and spoon, and a box of matches. My blankets are strapped behind my saddle, some forage in front, a small bag of smoking tobacco tied on one side and a canteen of fresh water on the other, my case of instruments in one saddle bag and a bottle of whisky in the other. Altogether I think I am prepared for almost any emergency.

June 9. The big scare that we all had on when I last wrote has in some degree become mitigated, but we are still in expectation of something remarkable turning up before long. I rode over to Genl. Hooker's headquarters yesterday, a distance of about 12 miles, but found that nobody there knew anything with certainty. One division of the 6th Corps is across the river below Fredericksburg[1] but they have effected nothing as yet, and it is not clear as to what they can effect. There was some firing this morning on our right so that I presume another division is across above but that is about all the war news I can give at present. . . . We captured a number of guerillas this morning and they have just passed by under escort. I think we must certainly march before long, but cannot tell which way nor for what purpose.

June 10. I have just returned from a 24 miles ride down to the Corps Hospital to examine some sick officers. . . . Of war news we have but little—there was a cavalry fight[2] across the river yesterday, in which we did not make anything except a little experience. Everything seems to be quiet, the Rebel pickets go in swimming with our men and we seem to be in a state of Quakerdom for the present. Long may it wave.

[1] Presumably in reconnoissance concerning the Confederate right.

[2] The all-day cavalry engagement of Beverly Ford.

June 12. The Army got a big scare on last night—orders came to pack up—the sick were sent off—all surplus baggage was sent to the rear, and at 4 o'clock this morning we expected to be across the river, but at six o'clock I woke up and found my canvas walls still standing and all quiet on the Rappahannock. We may move in an hour, to-day, to-morrow, or next week—but on this uninteresting subject I will not discourse further. . . . I have not been feeling well for the last three or four days. My head aches all the time and I cannot sleep—when it comes to marching and having something to do I presume I shall be all right again. . . . I have done nothing all day but lounge on the bed and wish I was in Halifax or any where else except in the Army of the Potomac. . . . A pleasant breeze is blowing through the pine trees this evening, and I hear the tramp of feet and rattle of muskets as they are mounting guard outside. Active preparations for supper are going on at the bivouac fire at the foot of the little hill on the crest of which my tent is pitched. Hurrah! here is a letter from you now—wait till I read it and see what it is about.

June 15. On the march, Bristoe Station, Va. Here we are, rushing frantically toward Manassas from which we are distant about 4 miles. It is about 10 A.M. and hotter than the hinges of—well—a very hot place. We have been marching rapidly since 5 A.M. and the men are almost dead beat. We marched all night before last and all day yesterday. No fighting yet except a little cavalry skirmish. 2 P.M. We are now at Manassas Junction, one battery in position, and are waiting for orders which will come thick and fast now for a day or two. I have just had a piece of broiled salt pork and two hard crackers and am smoking my pipe under a big oak. Here comes the order to move—good bye, Kitten. 6 P.M. We are now lying in line of battle one mile from Manassas Junction, and are going to stay here all night. I do not believe that any battle will take place here at present, but think we shall fall back on Centreville to-morrow. The 11th Corps is there to-night. Nell is cooking my supper—a luxurious one too—fresh beef, coffee, crackers, and a jar of pickles

which I confiscated this evening. I send this off by a discharged soldier who will put it in the Washington post office on the 17th. . . . I am sleeping in a big clover field to-night.

June 16. It is now noon and we are lying in line of battle on the ridge overlooking the plains of Manassas. Out of one end of my little shelter tent I look over the broad valley to the blue line of the Bull Run Mountains, and Thoroughfare Gap is just opposite. . . . We have all sorts of rumours afloat but no one knows anything with certainty—we have seen no mails or papers and Lee may be anywhere between Richmond and New York for all I know. The general idea is that we are going on to Centreville to-night. . . . The poor Army of the Potomac has come up to get its annual thrashing, I suppose—also to get a new general commanding. . . . I should like to hear the flying rumours about Washington to-day.

June 17. Centreville, 7 A.M. We are lying on the grass here waiting for the wagons to get out of the way, when we shall probably make tracks for Leesburg. We left Manassas at three o'clock this morning and I suppose have a hard day's work before us. I think it not unlikely that we shall be in Maryland to-morrow night. Ramsey is asleep on the grass at my side. Dick is bursting himself with clover—there goes the bugle—I must stop.

Gum Springs, 4 P.M. We have halted here for dinner and rest after a rapid and hot march—two of my men dead of sunstroke. We are going to Goose Creek and from there to Leesburg.

6 P.M. Artillery firing is going on on the right and we are ordered to be ready to move off at a moment's notice. The men have all had a bath and some coffee.

June 18, 12 M. We are still lying here and all is quiet. The heat is terrible. I am stretched in an ambulance, just in front at six paces distance is the creek—on the opposite bank are 6 large sycamores under which the officers are lying asleep or smoking—two of them are fishing for frogs. Nell is coiled

up under the ambulance and Dick is fighting the flies. We have no papers or mail and know nothing of the movements of the Rebs or of our own Army beyond our own Corps. They don't seem to be in a hurry to do anything with us at all events. I hope Genl. Dix or Peck will make a move now. I think Lee will be driven back down the Shenandoah Valley before long, but it will soon be too hot for active campaigning and we don't seem to get any nearer Richmond.

June 18. Camp at Gum Springs, Va. A heavy thunderstorm has just passed over and it is still raining, making the air delightfully cool and pleasant. Frog fishing has been the order of the day and Capt. Clinton[1] sits on the bank and looks for them with his field-glass while the others catch them. I shall describe the order of the day's march for you. Reveille sounds at three o'clock in the morning—up we all get and I take a good wash and fill my pipe and smoke peacefully. By the time that is done, Nell brings me a tin cup of coffee, two hard crackers and a piece of fried ham. Then I fill another pipe and have the steward call up the sick of both Regiments and I prescribe for them—giving passes for the ambulance to those whom I deem unable to march. By the time this is done Nell and Shorty have struck my tent, packed up my things and saddled Dick, who has been all this time eating his breakfast. Then the assembly sounds and I stroll round smoking and sympathizing with the miseries of my fellow sinners. By the way, Shorty is a character I have not introduced yet. He is a little Jew boy, about 4 feet high, 17 years old, and drinks, chews, smokes, gambles, lies, steals, and altogether is the hardest little case I ever saw, but he is faithful as a dog to me and never goes out of reach of the sound of my voice night or day. On the march he is always at my horse's head to hold him if I have to get off to see a sick man. About 1 P.M. we halt near some creek, I unsaddle Dick and let him go into the grass, my cook gets a cup of coffee and a hard cracker, and I smoke a pipe. About 6 P.M. we halt for the night, when the performance is the same, washing, eating,

[1] William Clinton, Captain, Tenth United States Infantry.

smoking, lounging on the grass, and sleeping. Then we are kept in an agreeable state of chronic excitement by all sorts of terrible rumours which, with the officers' comments thereon, are as good as a newspaper and just as reliable. After we have toddled round a week or two, we shall go into camp again and then there will be a big mail, something to eat, and a good bed.

June 20. Aldie Gap. We started on the march last night at 5 P.M. and reached this Gap in the Catoctin Mountains at 9 P.M. in the midst of a driving rain which has continued all night. The ground was mud and we could get no fire, so that I was cold and wet all night and have nothing but hard bread this morning which I cannot eat—so I feel pretty miserable. But the first thing I saw on turning out this morning was a beautiful little rose bud, which I took as a good omen, and I will send it to you as a memorial of my miseries.

June 21. Camp at Aldie Gap. 8 A.M. A foggy, dirty, disagreeable morning, Kathie. I have just had breakfast and made ready for the march upon which I suppose we shall start in about an hour. . . . Yesterday orders came to reduce the officers' transportation and there were some very funny scenes at the wagon train with officers selecting what they could leave and what retain. I threw away all my mess furniture but nothing else. We appear to be going about in an uncertain purposeless sort of way, and I don't believe Hooker knows where the Rebels are nor indeed where one half of his own troops are.

12 M. Part of the Division has gone out and heavy cannonading is going on in the front—this brigade is lying under arms and will probably leave before long. The sun has not shown his face to-day and everybody has the blues—as for me, I have been asleep about all the forenoon. 4 P.M. All is quiet here but the firing continues across the mountains—it does not amount to much beyond a skirmish between Barnes's Division[1] and about 2,000 Rebs—none of our Divi-

[1] First Division, Fifth Corps.

sion are in it. Over here they are eating, drinking, playing cards, and listening to the band, which is playing selections from *Trovatore*, while just on the other side they are knocking each other to pieces regardless of expense. Well, as Mrs. Gamp says—sich is life, vich likewise is the end of all things earthly. . . . The only thing I have to read is that little thick chemistry which I carry in my saddle bags and use for a pillow at night. . . . I can safely report the Army to be all right and in a fair way to perform some exploits before long, but you know I must not disclose its plans and purposes prematurely as the reporters say. Sufficient unto the day is the evil thereof is a proverb I never fully appreciated until I came into the field—here I find it not only so but also.

8 P.M. We have good news to-night—we have driven the enemy some 6 miles and captured two guns.

June 22. A beautiful sunny day. . . . No news this morning, no firing to be heard, no orders to move. All quiet in fact.

June 24. Aldie Gap again. We are still under our shelter tents just as we were dumped down three days ago—no news, no mail, nothing to eat but ham, hard bread and coffee—but the weather is pleasant, wood, water and grass are plentiful and there is no dust. The wicked rebellion still flourishes and J. Hooker, Esqr., is reported as being in good health and spirits. I rode out through the gap this morning into Loudon Valley to Genl. Pleasonton's headquarters where I found Dr. McGill who is medical inspector for the cavalry corps. He tells me that brown Guy was killed by a shell in the fight at Beverly Ford, poor old fellow. I hope Dick will have better luck. We have no prospect of a move for a day or two, the Rebs show no disposition to attack, and J. Hooker, Esqr., is very comfortable where he is.

June 25. I have been playing sick a little since yesterday—a slight attack of fever I think, just enough to make me cross and blue. We moved camp yesterday about 100 yards and organized things in a systematic manner again. . . . Lying on

the ground with only one blanket becomes disagreeable after a week or so and I find it utterly impossible to eat hard bread now—I prefer shingle or oak chips for a change. I am getting demoralized and very much disgusted with the Army of the Potomac in every way. 6 P.M. It is now raining and my disgust is increasing. Nell has dug a ditch around my little shelter tent to keep me from being floated off and I have wrapped myself up in my big cavalry coat and shall meditate on the miseries of human life until I can get to sleep. Curtis[1] has just come in from picket—the triumphant possessor of a feather pillow which he got at some house out there—also brought 4 chickens—whereon he was greeted warmly by all his acquaintances. I have had a harder time on this march than I did at Chancellorsville. I hope and pray that a general engagement will occur before long—I think I had rather be killed at once than endure this a month longer.

[*Hooker crosses the Potomac; Advance on Gettysburg. General Meade succeeds Hooker as Commander of the Army of the Potomac.*]

June 27. On the march. We are halted for the men to take off their shoes, stockings and breeches preparatory to wading the Monocacy. We started at 2 A.M. yesterday morning and marched all day, passing through Leesburg. We crossed the Potomac at Edwards' Ferry and camped about 5 miles from that place. 10 A.M. We have now halted at the base of Sugar Loaf Mountain in the woods and the men are making some coffee. I suppose we are going somewhere near Frederick. I feel somewhat better to-day than yesterday although I am quite weak but I hope we shall have two or three days' rest now for I don't think J. Hooker will attack immediately—if he does he will surely get thrashed. Nobody here seems to think that Lee contemplates anything more than a grand raid, and do not believe that he has the remotest intention of approaching Washington or even of having a battle if he can help it.

[1] Edward M. Curtis, Lieutenant, Seventh United States Infantry.

Camp near Monocacy Junction, Md. 6 P.M. Here we are in the woods waiting for our suppers—everybody footsore and weary from our 40 mile march, and just 3 miles from Frederick. I am lying on my back with my head in the hollow of my saddle. Nell, after much exertion and getting very red in the face, has got my big boots off and has gone off to prepare the usual cup of coffee. Of course we do not know where Lee is, but hear that the Reb scouts are at South Mountain about 10 miles away. There is no prospect of any fight for three or four days at least.

June 28, 9 A.M. No news. We are lying quiet. Good-bye.

June 29. Camp near Frederick City, Md., 6 A.M. I have washed and sharpened my teeth and am seated on a big log writing on a piece of board and waiting for my breakfast. Yesterday evening the mail for three weeks came in and caused universal rejoicing. I got 9 letters from you, one from Emma, and one from Mother, and a very pleasant time I had in reading them. Yesterday morning I rode up to Frederick, where I learned that Hooker has been relieved and Genl. Meade put in his place. I went to General Headquarters and to Pleasonton's headquarters and saw an immense number of officers—the general feeling seems to be utter apathy and indifference. I saw no man with a smile on his face and heard no one say that he was glad of Meade's appointment, although there is approval of Hooker's removal.

9 A.M. Just as we sat down to breakfast the bugle sounded the General, and now we are drawn up ready to march. I feel very well this morning and am ready for anything. There will probably be no battle for a long time, at least for us as we are in the rear of the Army. . . . We do not know where we are going, further than that it is towards Pennsylvania—our troops are beyond Boonsboro and we are closing up now. The main Reb Army must be 40 miles away, if not 60.

10 A.M. We have to lie here for three hours in the rain without our tents, which are packed on the mules, waiting for the pontoon train, which is blocking up the road, to get

out of the way. . . . Remember me to Ingram,[1] Curtis, and Mitchell. I send you a 4-leaved clover which came from the Monroe house of Fairfax, also an elder blossom from Ball's Bluff. Good-bye, Kathie—be good and cheerful and patient for the good time coming.

This was the last letter written by Dr. Billings to his wife before the battle of Gettysburg. The Fifth Corps went into camp at Hanover, Pa., on the afternoon of July 1st, where the news of the battle reached them. The Division was immediately set in motion and marched into position at Gettysburg about 6 A.M. on July 2nd, at first acting as a reserve on the Union right, but at 3:30 P.M. moved to the left of the Peach Orchard and to the right of Little Round Top, supporting Sickles's position, which was furiously assaulted after 4 P.M. by Hood's Division. The part which Dr. Billings played in the battle of Gettysburg may be best described in the language of his own official report:

[July 1–3. *Battle of Gettysburg.*]

. . . About the middle of June, the 2d Division of the Fifth Corps took up its line of march, which, passing successively through Benson's Mills, Catlett's Station, Manassas, Centreville, Gum Spring, Aldie Gap, Leesburg, Edwards's Ferry, and Frederick, terminated, so far as I was concerned, at Gettysburg, Pennsylvania, on the morning of the 2d of July. On this march, all the ambulances were collected into a train, which followed immediately behind the Division, and was superintended by a medical officer detailed for the purpose. Transportation was allowed in the proportion of one wagon for the medical supplies of two regiments, and this train of wagons followed close behind the ambulances. For the approaching battle, I was detailed as surgeon in charge of the field hospital of the Division, and, also, as one of the operators,

[1] Alexander Ingram, Medical Officer, United States Army, 1861–5.

my assistants being Assistant Surgeons Whittingham and Breneman,[1] U. S. A. At this time, I was attached to the 7th Infantry, and also acted as medical officer for the 10th Infantry during the march. On the 1st of July, about four o'clock P.M., the Division reached Hanover, distant about twelve miles from Gettysburg, and went into camp. Just as the tents were fairly pitched, news came of the repulse of the First Corps, and a few minutes later, we were on the road to Gettysburg. About six A.M., July 2d, the Division marched into position, and formed line of battle on the right of the somewhat horse-shoe shaped line in which our Army was drawn up. . . . About half past three o'clock P.M., the Division was brought into action, marching down a little road to the right of the large conical hill called Round Top, which was on the extreme left of the long arm of our horse-shoe like line of battle. I accompanied my regiment until they were under fire, and was then ordered to repair to a large stone house and barn, near the base of Round Top, and there establish a field hospital. When I reached the place, our skirmishers were lying behind the stone walls around the house, and as I rode up, a small body of Rebels further up the hill, and about seventy-five yards off, saluted me with a volley. They were captured a moment afterwards by a regiment which had passed between them and their own line. On entering the house, I found it unoccupied and bearing evident traces of the hasty desertion of its inmates. A good fire was blazing in the kitchen stove, a large quantity of dough was mixed up, the bake-pans were greased; in short, everything was ready for use. I immediately set my attendants at work baking bread and heating large boilers of water. In five minutes, I was joined by the other medical officers detailed for the hospital. The ambulance train reported to me fifteen minutes later, having with it three Autenrieth wagons, and by the time the operating tables were set up, and materials for dressing arranged, the wounded began to pour in. I performed a large number of operations of various kinds, received and fed seven hundred and fifty wounded,

[1] Edward De W. Breneman, Medical Officer, United States Army, 1862–7.

and worked all that night without cessation. An agent of the Sanitary Commission visited me in the evening, and furnished me with a barrel of crackers, a few lemons, etc. Of stimulants, chloroform, morphine, and materials for dressing, the Autenrieth wagons furnished an ample supply.

On July 3d, at seven o'clock A.M., I was ordered by Surgeon Milhau,[1] medical director of the corps, to remove the hospital to a point about one mile to the rear. This was done as rapidly as possible. A few shells began to drop in as the first train of ambulances moved off, and by eleven o'clock A.M. the fire on that point was quite brisk. Little or no damage was done, however, and by four o'clock P.M., all the wounded were safely removed. The new site was a grove of large trees, entirely free from underbrush, on the banks of a little creek, about half a mile from the Baltimore turnpike. By means of shelter-tents, india-rubber blankets, etc., shelter was arranged for all the worst cases, and two thousand dry rations, with three oxen, were sent to the hospital by Doctor Milhau in the course of the afternoon. All of this day, I was employed in operating and in dressing the more urgent cases. The following morning, it began to rain, and continued to do so for five days and nights with very little cessation. On the morning of the 5th, the regimental medical supply wagons came up, and from them I removed all the hospital tents and tent flies, with two hospital mess chests. On this day, the Division moved. I was left behind in charge of the hospital, which then contained about eight hundred wounded. Twenty men were detailed from the division to act as assistants about the hospital. I was also given two ambulances and two six-mule wagons. The ambulance train, which had up to this time been engaged in collecting the wounded of the Division from the various corps hospitals to which some of them had been carried, and in hauling straw for bedding, accompanied the Division, as did also the Autenrieth wagons. By this time, Assistant Surgeon Brinton[2] had reached White Church with a special medical supply train, and from him I procured such

[1] John J. Milhau, Medical Officer, United States Army, 1851–76.

[2] Jeremiah B. Brinton, Medical Officer, United States Army, 1862–5.

supplies as were most needed. The greatest want which I experienced was that of tools. I had not a shovel or pick with which to bury the dead or construct sinks, and no axes. I was compelled to send out a foraging party to the farm houses, who, after a day's labour, succeeded in procuring two shovels and an axe. Seventeen hospital tents were pitched, and in these were placed all the most severe cases, about seventy-five in number. Under the tent flies, I placed one hundred more patients, and the remainder were all under shelter-tents, and were arranged by regiments. By means of the wagons, I procured abundance of clean fresh straw from about five miles distance, and commissary stores and fresh beef were furnished *ad libitum*. Assistant Surgeons Ramsey, Whittingham,[1] Bacon, and Breneman, U. S. A., and two surgeons of volunteer regiments, whose names I cannot at this moment recall, remained with me, and through their energy and zeal the labour of organizing the hospital was quickly completed. Especial praise is due to Doctors Ramsey and Whittingham, whose labours were unceasing, and from whom I received many valuable suggestions. Very few shell wounds came under my notice at this battle, and none from round balls or buckshot. Most of the wounds were from the conoidal ball, and a large proportion were in the lower extremities. Of three exsections of the shoulder joint, all were successful in so far as that the patients recovered. In one case, I removed four and a half inches of the shaft. No cases of tetanus occurred in this hospital. Of secondary hæmorrhage there were thirteen cases up to the 22d of July, at which time I left the hospital. Three of these cases occurred after amputation of the thigh; in two the hæmorrhage was arrested by pressure, and, in the third, it was found necessary to open the flaps and secure the bleeding vessel. Three cases of hæmorrhage from the anterior tibial artery occurred; two were arrested by pressure, and, in the third, amputation was performed with a good result. In one case, the internal maxillary was the bleeding vessel. The hæmorrhage in this case was readily controlled by pressure and persulphate of

[1] Edward T. Whittingham, Medical Officer, United States Army, 1862–3.

iron. Assistant Surgeon Howard,[1] U. S. A., left in the hospital six cases of gunshot wounds of the thorax, all of which he had treated by hermetically sealing the orifice with collodion. Four of these men died. What became of the other two, I do not know. In one of these cases, I made a post mortem examination, and found an abscess of the lung, communicating with the pleural cavity, which last was filled with a sanio-purulent fluid. Four cases of a similar nature were treated with moist charpie. One of these died, and one was dying when I left; the other two were, in my opinion, in a fair way to recover. Five cases of gunshot fracture of the cranium came under my notice. Four of these involved the occipital bone, and all were fatal. A low muttering form of delirium, with occasional paroxysms of furious mania, was present in all from the commencement. Two cases occurred of gunshot fracture of the femur in the upper third. Both were treated by Smith's anterior splint, and one died. In no case of fracture of the long bones did I attempt any formal resection, but confined myself to removing splinters and foreign bodies, and cutting off very sharp projecting points with the bone forceps. From my experience in Cliffburne Hospital, I am convinced that regular resections in such cases are worse than doing nothing at all. I partially resected the elbow joint in two cases, and the wrist in three. The wounds generally granulated and took on a healthy appearance with great and unusual rapidity, which fact I attributed to the following circumstances: they were in the open air, were, many of them, exposed for the first few days to a warm rain; they had plenty of good food, and flaxseed poultices were unknown.

On July 6th, Dr. Billings wrote to his wife as follows:

Hospital near White Church, Penna. Before you get this you will know from a note of Ramsey's that I have passed through another great battle and am safe and sound. I am utterly exhausted mentally and physically, have been operating night and day and am still hard at work. I have been

[1] Benjamin Howard, Medical Officer, United States Army, 1861–4.

left here in charge of 700 wounded, with no supplies and have got my hands full. Our Division lost terribly—over 30 per cent. were killed and wounded. I had my left ear just touched with a ball and Dick's mane was cut in two places. I suppose we shall stay here three or four days and then I shall rejoin my regiment. The Rebs are on a big skedaddle they say, and I suppose we shall be across the Potomac before long. They may fight another Antietam again first however. . . . Ramsey is well—has gone to Gettysburg to try and get some tools with which to bury our dead. It has rained steadily for four days but I have got all the wounded under cover at last and they have all got soup and coffee, but many of them cannot have their wounds dressed oftener than once in two days.

July 9. Hospital near Gettysburg. 6 A.M. The days creep by and I am still trying to produce order out of chaos, and to get my wounded patriots into something like a state of comfort. I am going to send 100 of them to Baltimore this morning, which will relieve me a little. It has rained steadily all the time until last night, when it cleared up, and the sun is shining splendidly this morning—if I can get some dry straw for the men and pry them out of the mud, we shall be in Arcady. I hear that Vicksburg is taken and that the wicked and unholy is crushed entirely here—I do not think there can be very much left of Lee's Army. . . . I suppose I shall rejoin the Army in about three or four days, so you need not direct any of your letters here.

P.M. I am covered with blood and am tired out almost completely, and can only say that I wish I was with you to-night and could lie down and sleep for 16 hours without stopping. I have been operating all day long and have got the chief part of the butchering done in a satisfactory manner. Everybody is fed and comfortably lodged and altogether I have a very nice little Hospital with about 600 men, having sent off 100—all that were able to walk—yesterday. I don't know how long I shall be here—probably 3 or 4 days, and have no idea where I shall find the Army, somewhere near Frederick, I suppose.

July 10, 6 P.M. Another day has slipped around and the shadows of the trees begin to fall long and dark, so I will pencil off another line or two that you may know that I am still flourishing. Nell has just scrubbed all the blood out of my hair with Castile soap and bay-rum and my scalp feels as if a steam plough had been passed through it. I am fast getting things into shape and the men are very comfortable. I have sent Ramsey off with two big wagons to get butter, eggs, soft bread, and everything else that he can pick up from the Sanitary Commission and various Relief Associations that now swarm in Gettysburg, and then I shall be all right.

July 11. Dr. Packard,[1] of Phila., was out here last night. I am off to Gettysburg in a hurry. If you had any one to come up with you I wish you could come up here and stay three or four days—but it is out of the question for you to come alone.

July 11, 9 P.M. The Hospital has become tolerably quiet—the day's work is over—and I have only to scratch off a few lines to let you know where I am and then turn in for a snooze. Things are beginning to look very well now and I believe from what everyone says who has been about that I have the best Hospital here. I do not know yet when I shall join my regiment but not for four or five days certainly. . . . Dr. Packard, of the West Philadelphia Hospital was out here last night—says that everybody is prosperous but that they were terribly frightened at Philadelphia and began to fortify Chestnut Hill.

During the eleven days elapsing between the forced march from Hanover (July 1) and the above date, Dr. Billings had been subjected to a degree of mental stress and physical strain such as few men, even possessing his strong constitution, could have withstood. His extraordinary labours at Gettysburg—performing surgical operations, caring for the wounded under artillery fire,

[1] John H. Packard, contract surgeon for hospital duty, 1861-5.

and for some nine days running after the battle, looking after transportation, obtaining supplies for his patients, burying the dead, organizing his hospital service—told upon him in the end, and his health was so shattered that, after continuing on duty at the hospital until July 20th, he was obliged to apply for thirty days' sick leave. He left the Fifth Corps Field Hospital, July 22, 1863, and rejoined his command in August.

About the middle of July, 1863, the Draft Riots in New York City were assuming dangerous proportions and several regiments of veterans from the Army of the Potomac were sent to quell the disturbance. Dr. Billings after his sick leave rejoined the Seventh Infantry and we next find him

On the Transport Daniel Webster, opposite Aquia Creek, August 18, 10 A.M. I reached Alexandria at 10 A.M. Sunday and found my regiment without any trouble. Everyone was very glad to see me and I took up my quarters in the sitting room of the Marshall House, the one where Ellsworth was killed,[1] you remember. We did not embark until Monday (last night) and left Alexandria at three o'clock this morning. I could not get back to Washington however, as we expected to go every hour. I found Nell with all my things. Dick was hurt very badly in getting him on the ship, I hope not seriously.

August 20, 7 A.M. We are just entering the Narrows and will be in New York Harbour in about three hours. We have had a very pleasant trip, rather rough yesterday afternoon, causing considerable sea sickness, but I escaped, which I think is rather remarkable. . . . Of course I know nothing yet as to where I am going.

Delmonico's, 5 P.M. We have gone into camp on 5th Avenue above 49th Street, and here I am at dinner in most *recherché* style. I shall stay all night at Lieut. Curtis's house

[1] May 24, 1861.

on 17th Street. After the draft is over we expect to go to Governor's Island.

August 26. Up in camp (Corner 49th Street and 5th Avenue, New York City). It is 10 P.M., the moonlight is pouring into my tent door most magnificently. All noise has ceased for an hour and before I go to sleep I must talk to you awhile. I think it is very strange I do not hear from you yet. . . . I was very much astonished this afternoon by the entrance of Dr. Ramsey who is on his way to Charleston on temporary duty. . . . There is no telling how long I shall be here.

We next find him at the McDougall General Hospital, Fort Schuyler, New York Harbour.

September 12, 7 P.M. The evening gun was fired some time ago and, as it is getting damp and chilly, I have retired to my tent and before going to bed, which I propose to do very early, I will tell you how we did it. We left New York about 11 o'clock this morning and arrived here in a very jolly condition about noon. Then we found that there was no one here who knew anything or could do anything, that we had nothing to eat and that there was no means of getting anything, and then our jollity began to disappear. There is a large hospital just back of the Fort called the McDougall Hospital. It holds about 1800 men and is very nice—better than West Philadelphia by a good deal. I went over, introduced myself to the surgeon in charge, who is on contract, and succeeded in begging supper for all of the 7th officers. The 20th Indiana are quartered on the slope of the Fort and have taken up all the quarters there are, so that we must all stick to our tents. Genl. Brown has 8 rooms for his own use and you may suppose that there is not much left for anyone else.

September 24. I am enjoying the ripeness of September at the seaside, feel pretty well, had smoked halibut for breakfast and want to get this off so you can get it Sunday. The

weather is superb, *magnifique*—I drink in the air like wine, take a ride almost every day, and kill time as rapidly and effectually as I can. I am going down to New York on Saturday where I shall meet Lieut. Curtis and go with him up to West Point, staying over Sunday and being introduced to a number of the first families—or such as he so considers. I think the trip will be pleasant, although I hate to be introduced to strangers, for in five cases out of six I become silent and stupid immediately. . . . Nell has just brought in some grapes and cheese and crackers out of which I propose to make a most substantial lunch in a few minutes. Our mess here is by no means equal to Delmonico's—in fact it is very poor and I have to take an extra lunch occasionally to keep along.

September 25. I have tried almost every method of killing time this morning but with small success. The day is cold, with a drizzling rain falling, so that I have to stay in doors. I have read and smoked till I was tired, and I threw myself on my cot and looked from the open door of my tent down the slope of the glacis, but could see nothing but an avenue of white tents terminating in a little arm of the river and beyond that the tops of the trees. Then glancing around the tent I spied my lunch basket—so I ate up all the crackers and cheese there was in it and then I was very nearly at the end of my resources. . . . Yesterday I took a ride to Pelham Bridge, a very beautiful place about five miles away and a famous place for catching fish; after that I played billiards for an hour, got supper, went over to the Hospital and played whist until 10 P.M., getting rid of the dragging hours in a very pleasant manner. When I go to the City to-morrow, I am going to ask Dr. McDougall[1] to give me a place where I can have something to do in a professional way, such as taking charge of a ward in the Hospital or something of that kind. . . . I suppose I might as well get used to the monotony and idleness of post life, for when this cruel war is over it will become my

[1] Charles McDougall, Medical Officer, United States Army, 1832–85; Medical Director, Department of the East in 1863.

usual mode of existence. . . . The great weapon I have always wielded against ennui has been reading and study, but that seems to have lost its efficacy. There goes the 12 o'clock call and here come the men from drill—I wonder how they like the change from muskets to heavy cannon and Columbiads. They are glad enough to be here however, and to have the prospect before them of remaining here all winter.

September 27. Yesterday I went down to the City and found an order there sending me to Watertown, N. Y., near Sackett's Harbour, to inspect some drafted men and substitutes. I suppose I shall be gone between one and two weeks. I shall start to-morrow.

October 3. A back room in a Provost Marshal's Office, Watertown, N. Y. Business is very brisk just now, with every prospect of a rise. I think we shall just about get through here next week and I shall go back to New York Saturday night. I am glad I came up here—it is a new kind of work and some funny things occur now and then. Fancy a large red-cheeked farmer coming in and telling that he is so weak that he couldn't lift a dog's tail if it curled. Every man seems to have a skeleton in his house of some kind or other, and we find it out to a certainty if any exists. To-morrow, being Sunday, I am going with two other gentlemen to explore a large cave on the Black River, about three miles from here.

On October 13, 1863, Dr. Billings received his definite assignment to the McDougall Hospital; on October 29th, he was transferred to the De Camp General Hospital, David's Island, New York Harbour, of which he was placed in charge; and from November 13, 1863, until April 8, 1864, he was stationed at the Convalescent Hospital, Bedloe's Island, New York Harbour. Here the monotony and inaction of post life, at which he always chafed, were probably the same as he has described, diversified by the usual pleasant interludes.

December 5. I sold Dick yesterday to the Quartermaster, getting $140, and he will soon be in the Army of the Potomac again. Night before last I staid over at Mrs. Curtis's, listening to music and looking at engravings and altogether had a very pleasant time. . . . Mr. Curtis has finished his examination and passed with flying colours—he is more jubilant than I have ever seen him before. Matters at the Hospital are going on with tolerable smoothness. The papers relative to my dispute with Col. Merchant have been sent to Genl. Dix for decision and, in the meantime, the Colonel and myself are on the most excellent terms. . . . I wish I could feel more like studying than I do, for I think Congress is going to so alter the laws this winter that I shall have to stand another examination before long, and I don't feel at all prepared for anything of that sort, neither do I feel much like preparing myself. I shall shake off my lethargy in a day or two, I hope, and go to studying again as of old. . . .

Between February 5th, and March 21, 1864, Dr. Billings was put in charge of an enterprise which was to relieve him of the tedium of post life and of which he has left a personal memorandum:

While at Bedloe's Island in February, 1864, I received an order to report on board the ship *Marcia C. Day*, then lying in the harbour of New York. On going on board I found that she was a ship of about 1,000 tons burden, having on board an officer with a small detachment of the invalid corps, and being under orders to proceed to a certain point in the Atlantic Ocean east of Florida and there open enclosed sealed orders. Possible clues to her destination were a number of boxes of drugs and surgical instruments addressed to Assistant Surgeon John S. Billings, U. S. A., Isthmus of Panama, and the fact that the hold had been cleared out and fitted up roughly with wo story wooden bunks. Many were the speculations as to where we were going and what we were going for.

On arriving at the point where the sealed order was to be opened, there was found enclosed another order to proceed

to a point half way between the west end of Hayti and the east end of Cuba and there open another enclosed sealed order. On arriving at this point and opening this sealed order we found an order to proceed to the Ile à Vache on the south coast of Hayti opposite Aux Cayes, and there take on board a number of negroes, who had been sent down there from Virginia, and bring them back to the United States.

This colony of negroes was one started in 1862, in pursuance of the then policy of the government to attempt to settle freed slaves in outlying districts or islands, such as Liberia or Hayti. On December 31, 1862, President Lincoln signed a contract with one Bernard Kock under which the latter agreed to colonize 5,000 negroes on the Ile à Vache at $50.00 per head, binding himself to furnish them with houses, garden lots, churches, and schools, to find them food and medical attendance and to employ them as freedmen for four years at rates of from $4.00 to $10.00 per month. Kock then got up a scheme of speculation, holding out most alluring prospects to New York and Boston capitalists (600 per cent. in nine months) and many of these were beguiled into investing their money. Kock soon turned out to be "an irresponsible and untruthful adventurer" and it was even rumoured that he was in league with Semmes of the *Alabama* to turn over the negroes to the latter as "captured run-away slaves." The President speedily cancelled the contract and the capitalists made Kock turn over his lease of the island to them, themselves entering into a new contract with the Secretary of the Interior (April 6, 1863), under which a ship load of negro emigrants, some 411 to 453 persons, were sent on the *Ocean Ranger* to the island. These rapidly died off from smallpox or other diseases, were tyrannized over by Kock, who had set up for the nonce, as a dummy governor of the colony until he was driven out, and the prospects of agricultural and similar

developments came to nothing. On December 12, 1863, the capitalists, through their silent partner, declined to give any further financial aid to the colonists and a special agent, sent by the President in October, reported that there were 371 survivors of the original emigrants, all dissatisfied and in desperate straits. The Haytian Government was furthermore unwilling that they should remain there, and accordingly the Secretary of the Interior sent the *Marcia C. Day* to bring them back. On March 4, 1864, this vessel with the survivors sailed from the island, reaching Alexandria, Virginia, on March 20. The fact that Dr. Billings was put in charge of this expedition under sealed orders from President Lincoln shows the high reputation he had already attained as an honourable and trustworthy officer. As has often happened in our political history, an honest man of strong character had to be found to patch up the mischief-making of a sharp practitioner.

On March 29, 1864, probably at his own request, Billings was relieved from the Department of the East, where the service was sedentary post duty, and was ordered to the Army of the Potomac. At that date, besides the forces about Washington, at Fort Monroe, and along the upper Potomac, and the troops more or less mobile in the Shenandoah Valley, there were available for the field in Virginia three distinct commands and four commanding generals. The Army of the James, under General Butler, was concentrating near Fort Monroe for a movement to Bermuda Hundred, just north of the mouth of the Appomattox. The Army of the Potomac, under General Meade, was encamped between the Rappahannock and the Rapidan rivers, and in actual contact but not in military union with it was the Ninth Corps, four strong divisions under General Burnside, which guarded the railroad in the rear. On February 26, 1864, General

Grant had been appointed a lieutenant-general, the only one of that grade in the Union Army, and given command, under the President, of all the military forces of the United States. General Grant's headquarters were at Culpeper Court House, and General Meade, with the headquarters of the Army of the Potomac, was six miles away, near Brandy Station. These two generals exercising distinct functions, their headquarters were not only not identical, as is commonly supposed, but were topographically separated.

Having reported at the headquarters of the Army of the Potomac on April 12th, Billings was assigned to duty with the Medical Director, Surgeon Thomas A. McParlin, on April 16th.

At this time, the Army of the Potomac was lying north of and not far from the Rapidan, and south of that river was Lee with the Army of Northern Virginia, strongly entrenched west of Mine Run. Soon after midnight, May 3d, Grant began the campaign which was to close the war by crossing the Rapidan, with Sheridan in the lead and Torbert guarding the rear, to find Lee confronting him next day in the tangled thicket of the Wilderness. Throughout this momentous campaign, up to his assignment to the Surgeon-General's Office on December 21, 1864, Dr. Billings was, to all intents and purposes a medical inspector of the Army of the Potomac, his duties under Medical Director McParlin being of the most varied and exacting kind. Constantly on horseback, keeping a strict eye on things everywhere, it was his duty to collect medical statistics, look after the disposition of ambulances and supplies in connection with the transportation and care of the wounded, write telegrams and assist in framing orders, supervise the collection of pathological specimens, send wounded and infectious cases from the field to hospitals with all dispatch, and sometimes

even to operate in difficult cases. Here he undoubtedly developed his remarkable talent for organization and administration. His skill in improvising messages of unmistakable clearness and precision won for him the praise of his ranking officers and fixed his future ideal of a literary style which should be, as he long afterward expressed it, "concise as a telegram." In attempting to give a picture of his experiences, which extended up to the investment of Petersburg, we shall rely partly on his letters to his wife and partly on the very careful and circumstantial records in his pocket note-books. On April 16th, he was introduced to General Grant, and his first impression of the unpretentious man of Appomattox is a true and accurate one:

April 17, 1864. Nothing new or important has happened yet, but everyone is busy getting ready for the good time coming. The Headquarters are now located near Brandy Station, 6 miles from Culpeper. Yesterday I went up to Culpeper, saw Major Dent, who inquired very specially after you, was introduced by him to General Grant and took dinner with the General[1] and his staff. I *like* Genl. Grant. He is a thoroughbred gentleman and suits me exactly. . . . I am at work making myself familiar with the records and business of the office. To-morrow I am going to ride around the 6th Corps and pick up what information I can. . . . I am going to try to ride over the whole Army before it moves and get acquainted with the doctors, so that I shall always be at home wherever I am. . . . There are a number of very pleasant

[1] It is known that General Grant not only held his medical officers in esteem, but attached a great deal of importance to their views and opinions in relation to the general well-being of his men. In this, he was perhaps but following the well-known dictum of his old chief, General Winfield Scott, U. S. A., who said: "I am in the habit, myself, when on duty with troops, of paying great deference, and even of yielding my opinion, on matters deeply affecting health and life, to the advice of my medical staff."

gentlemen on Meade's staff. My duties too are just what I like—I shall see and know all that is going on and shall not be overworked, while at the same time I shall have enough to do to keep me from getting blue. The weather is fine, the roads are drying up rapidly, and the Army will be able to move in a week I think. Where it will move to is unknown—I have an idea that operations will begin down on the Peninsula. . . . Remember me especially to the General[1] and tell him that I think I shall see Richmond before I do Washington.

April 17, 1864. This is Sunday morning—has been raining all night and is now cloudy and cool. I am going to ride up through the mud to Culpeper to-day, about 6 miles away to see some of my old friends of the 5th Corps. My duties here are gradually becoming defined—I am to be what you might call the Medical Statistician of the Army of the Potomac. I am to collect and consolidate all sorts of reports—and when a battle comes off I am to wander round from Hospital to Hospital collecting records—overseeing the surgery in an unofficial way—and noting down items. When the Army begins to move I shall wander about like a newspaper reporter. I am going to have a good time this summer—the sort of work just suits me—and I like my associates very much.

April 26. I have been very busy since I got down here, either riding or writing all the time and getting things into a proper condition for moving. We shall go in two or three days now.

April 30. Dr. Brinton sent me a barrel of whisky yesterday with which to preserve surgical specimens and immediately after the next battle, I expect to send enough pickled arms and legs to the Surgeon General to make a museum of themselves. . . . The Army has not yet moved and will not for three or four days. General Burnside's headquarters are at Warrenton Junction and his Corps lies along the railroad as far as the Rappahannock River. General Hooker with his

[1] His father-in-law, General Stevens.

column is probably in the Shenandoah Valley. . . . Altogether we have a tremendous force converging toward Richmond just now. (All of this is contraband and to be kept to yourself for a week at least.)

May 3. The Army moves at 3 A.M. to-morrow morning and I will be across the Rapidan by dark. The battle will probably come off on the 6th or 7th of May.

[*Grant's Army crosses the Rapidan.*]

May 4. 5 P.M. Headquarters moved at 5 this morning, travelling about 17 miles and crossing the Rapidan at Germanna Ford at 10 A.M. We are camped on the high bluffs overlooking the Ford, and as beautiful a sunset as I ever saw is now being exhibited for our benefit. The whole army is across the river and occupies Chancellorsville and ten miles of the road leading from that place to Orange Court House. As yet no signs of the enemy have been seen and it is very uncertain when or where we shall fight them. We have just had a dinner of broiled chicken, stewed tomatoes, etc. and I am smoking my pipe in a virtuous and jolly manner.

On the same day, Lee, with incredible swiftness, sent Ewell's corps along the turnpike and Hill's by the plank road, so that by nightfall they were half through the Wilderness, the former colliding with Warren on the morning of the 5th.

May 4 (Note-book). Bivouacked on the heights at Germanna Ford about 10 A.M. Troops marched well: stragglers mere boys—ambulances pretty full. 1 canvas pontoon bridge and 1 wooden at G. F. Canvas bridge to be taken up. Genl. Gregg[1] has been to Chancellorsville—found nothing but a few pickets. Cavalry headquarters are with us, 5th Corps is moving to the left, 6th Corps train finished crossing at 5 P.M. . . . Genl. Grant and staff join headquarters at 12 M.

[1] David McM. Gregg, cavalry officer, United States Army, 1855–65.

[May 5–6: *Battle of the Wilderness.*]

May 5. Sunny and pleasant. Headquarters moved at 6 A.M. Rode to Woodville Mine, found 1st Div., 5th Corps, in line of battle to the left, south of Orange and Alexandria road. 7 A.M. Dr. Dougherty[1] reports that he is already overloaded with sick and asks whether they can be sent to rear. 2nd Corps moved at 5 A.M. from Chancellorsville toward the Furnaces. 7:30 A.M. Enemy reported advancing along plank road. Reserve trains have been ordered to halt at Ely's Ford instead of Todd's Tavern. 11 A.M. Picket firing in front of the 5th Corps. Genl. Getty's[2] Division [2d Corps] moving up the plank road on which the Reb cavalry is reported. 5:30 P.M. The 2nd Corps is now engaged and the firing on the left is very heavy. Very little artillery has been used to-day. The enemy occupy the ground first held by 1st Div., 5th Corps, and a number of our wounded are left there. 560 wounded are now in 1st Div. Hospital, 5th Corps. Total number wounded in the hospitals of the 5th Corps is about 1700. The 2nd Division, 6th Corps, engaged the enemy and was forced to retire, losing about 1800 men; 1400 are in hospital. The 2nd Corps engaged about 4½ P.M. Their loss is not yet known. The general supply trains are up, lying near Woodville Mine. The 2nd and 3rd Divisions, 5th Corps, were in reserve and lost but few men—about 135 together. The 3rd Division, 6th Corps, was engaged about 6 P.M. but for a brief period. It retains its old position. 700 prisoners taken.

May 6, 5 A.M. Headquarters moved upon a little knoll west of plank road, about 100 yards from camp. Burnside's Corps was passing up the plank road. 5:15 A.M. Sedgwick engages the enemy. Firing on the left. 9:30 A.M. Batteries have been planted on the hill, about 150 yards west of plank

[1] Alexander V. Dougherty, Surgeon, United States Volunteers (Medical Division, Second Corps).

[2] George W. Getty, artillery and infantry officer, United States Army, 1840–82.

road, around present headquarters. 2 P.M. 2nd Div., 2nd Corps, engage. 250 wounded in hospital. Tents were not all up this morning. 3rd Div. went in at 3 P.M. 800 wounded. 18 tents but none up. 1st Div. has about 150 wounded. 18 tents up. 4th Div.: 250 wounded. All had commissary supplies. Large quantities of shelters up; deficiency in blankets, supply trains not being up. Ground fought on mostly covered with underbrush. Hospitals located on a slope one mile south-east of the junction of the Germanna Ford and Orange Court House plank roads. 12 M. Little firing has been heard since 10 A.M. Artillery firing is now going on on the left. Genl. Burnside has gone in on the right of the 2nd Corps. The reserve artillery is with the 5th Corps. 1 P.M. No firing since noon. Part of Burnside's Corps, becoming demoralized, came down the plank road straggling through the woods right and left. Genl. Patrick's Brigade, forming a skirmish line 1½ miles long, is now advancing, driving them back. (900 wounded in 1st Div. Hospital, 5th Corps.) Burnside's reserve turns. All the brigade supplies were up by 9 o'clock. 1st Div. Hospital has ice. 3:40 P.M. 6th Corps Hospital ordered to be moved. 4 P.M. Heavy rattling of musketry on the left. Dispatch just received from Hancock stating that the enemy had attacked on the Brock Road and been repulsed. 6 P.M. Order to remove 6th Corps Hospital revoked by Genl. Meade. Artillery firing in centre of line. Headquarter wagons are on the hills west of where it has been stationed to-day. 7:20 P.M. The right flank of the 6th Corps is turned and the Rebel skirmishers are on the plank road this side of the Spottswood House where the Hospital of 1st Div. 6th Corps is, containing nearly 500 wounded and the tents are up. (This is reported by Dr. Holman.) All the Division ambulances are also at the Hospital. 9:15 P.M. Genl. Meade orders the 6th Corps Hospitals to be removed back on the turnpike to touch the artillery reserve. Also 3rd Div. Hospital of 5th Corps to be moved. 9:40 P.M. 1st Div. Hospital, 5th Corps, quiet. 44 officers—about 700 men (wounded). Dr. Holman has been ordered to send for the train of the 1st Div., 6th Corps, if it can get through. One

case of variola in artillery brigade. 5th Corps under shelter about 200 yards east of the Hospital. . . . Genl. Sedgwick's line is all right.

[*Grant moves by the left flank to Spottsylvania Court House; Cavalry engagement (Sheridan and Stuart) at Todd's Tavern.*]

May 7, 9 A.M. Brinton is now at the crossing of the pike and plank road about 3 miles from Chancellorsville. Dr. Dalton reports that there are few or no men in the 6th Corps Hospitals who cannot be moved in case of necessity. . . . Burnside and Hancock report that having advanced their skirmishers, they find no enemy. It is supposed that the Rebels may be massing on our right and preparations are being made accordingly. All the trains are moving east on the pike. The day is close and sultry. Burnside's coloured troops are moving east on the turnpike to guard the trains. . . . 10:30 A.M. Genl. Meade orders that all the sick and wounded be sent to Washington by way of Ely's Ford. 4 P.M. Spottswood Hospital shelled at 2:30 P.M. 5 men and 35 Rebs left.

(Letter) May 8, 8 A.M. Headquarters A. of P.—all over the country. For the last three days the army has been shooting in a general way at everything they could find. We have thus far lost about 15,000 men, the Rebs about the same. Last night we had a terrible ride through the woods and swamps—have had nothing but one piece of hard bread since yesterday morning. We are going now toward Spottsylvania Court House. I am all right and only hope you and Birdie are. We send our wounded to Fredericksburg to-morrow.

(Note-book). 6:30 A.M. Cavalry corps headquarters are with us at Todd's Tavern. The 5th Corps are passing on the road leading S. W. Dr. Winne reports that about 200 wounded were left in the 5th Corps Hospital on account of lack of transportation; shelter, commissary, and medical supplies and medical officers were left with them. . . . 156 wounded now in the Cavalry Hospital near this place. . . . Wounds of Cavalry Corps are more serious now than formerly, as there is so much charging done. 10 A.M. Headquarters moved from

Todd's Tavern to Piney Branch Church. 11 A.M. All the wounded are ordered to Fredericksburg. Dr. Dalton is to remain in charge until relieved by some officer from Washing-
3 P.M. Headquarters ordered to break camp and move 2d the Spottsylvania road. Received order from Medical ctor to ride to Dr. Holman and get ambulances if possible assist in carrying off cavalry wounded. Rode down the ottsylvania road and found that the 5th Corps had been gaged and was in line of battle across the road. . . . The 1st Division has about 475 wounded. . . . All this part of the country is low and covered with dense second growth of forest. Little creeks are found frequently. No wind is felt anywhere, all is hot, dusty and sultry. All of the hospitals are in my opinion too close to the road. I saw 32 cases of sunstroke to-day.

May 9. 8 P.M. The army is ordered to rest to-day for the purpose of receiving rations and ammunition and to entrench itself. Another hot, sultry day. 11 A.M. General Sedgwick[1] just brought in from the front—died in 5 minutes after getting here, shot through the base of the brain by a sharpshooter. Sent a steward to cleanse the body, preparatory to having it embalmed. Genl. Meade is out in front with his staff, near Warren's headquarters. No fighting to-day. . . . I sent one spring wagon with ice with which to preserve if possible General Sedgwick's body which now lies here. . . . I have been at work this afternoon embalming General Sedgwick. . . . There was brisk firing for about 15 minutes at 6 P.M. on the

[1] Major General John Sedgwick (1813–64), of Cornwall, Connecticut, graduated from West Point in 1837, and, after serving with conspicuous gallantry in the Mexican War, was twice wounded at Antietam, and played a heroic part in the management of his corps, in connection with the battle of Chancellorsville particularly at Salem Church, and rendered equally distinguished and effective service at Gettysburg. He was one of the finest and bravest of the old line officers of the Army, an honourable, high-minded man of great simplicity of character, who exerted a strong influence upon the morale and discipline of his men. His statue stands on the plateau at West Point. He was held in especially high regard by Dr. Billings, who named his son after him.

left. The day has been warm and sunny. The band is now playing the *Miserere* from Trovatore. The entire Cavalry Corps started on the march to-day for James River, to connect with Butler. One ambulance to each brigade accompani· them but no wagons of any kind except for ammunition. Some medical supplies were taken on mules. No reports have ye come from the train of wounded sent with Dalton to Fredericksburg, and much anxiety is felt on their account. The cavalry reserve's trains are near Silver's house—they have no forage at all. All of our horses are cut down to 5 pounds of oats per day—they are getting used up. Our own rations are also short. . . . The movements of the cavalry for two days have been toward the left, in such a manner as to protect our train of wounded going to Fredericksburg. A rumour is here from Burnside, who is on the Chancellorsville road, that our train arrived safely. Burnside is also aware of the capture of the ambulances and of the suffering condition of the wounded in the abandoned hospitals and he has said he would attend to it. . . . We estimate 1600 wounded on hand to-night of whom 800 can walk and we have 230 army wagons which will carry the rest.

[*Assault of Warren's and Wright's Corps at Spottsylvania.*]

May 10. 8 A.M. Wounded ordered to be sent to Fredericksburg to-day. Circular issued from this office ordering medical directors of corps to put their wounded in army wagons. . . . No ambulances or spring wagons will be allowed to go. . . . The headquarters are on ploughed ground and very dirty. . . . A breeze is blowing to-day making it a little cooler than it has been. Col. Schriver's spring wagon was sent with General Sedgwick's body. 10 A.M. artillery firing is going on on the left. Total wounded 11,682. 1:30 P.M. . . . I request a supply for 15,000 men for 5 days to be sent to Belle Plain and that the chief medical officer there pack it in empty wagons and send them to Dr. Brinton with the forage and ammunition trains. Medical officers are nearly exhausted from working day and night and the medical officers sent to Fredericksburg should be returned as soon as possible. . . . We are engaging the enemy

daily and are constantly issuing supplies. If our advance is hotly contested we shall need supplies for 15,000 wounded for 5 or 6 days. McKenzie[1] to pack his steamers ready to move. . . . Dust is whirling in dense clouds. It is impossible to see 200 yards and equally impossible to eat. Artillery and skirmish firing has been going on all the afternoon. Dr. McParlin and myself have been talking in the tent, the darkies are all asleep in the wagon. . . . 4:30 P.M. A brisk fight is now going on, 175 wounded are now in the 6th Corps Hospital and more are coming in. 6 P.M. Headquarters broken up and moved down on the Piney Branch Church road. . . . The confusion and dust were terrible, heavy shell firing was going on in front, and a slight stampede resulted. I rode to the 5th Corps Hospitals at Cossins House and found everything in capital order. All the wounded [196 in number] had been sent off in army wagons. These wagons carried from 3 to 8 persons. The beds were thickly covered with blankets covered with evergreen boughs. Not one man has been sent away from these hospitals without one or two blankets. Those sent to-day had one day's rations. 125 wounded were sent from the 2nd Corps. In the 6th Corps they use hard bread boxes for seats. Lemons, peaches, ice and condensed milk were plenty. I rode to the 2d Corps—everything is working splendidly. 9:15 P.M. There was to have been a general attack at 5 P.M. to-day but it was limited in most places to artillery work. The 2nd Corps lost heavily this evening.

(Letter.) May 11. 6 A.M. We had a very extensive shindy yesterday afternoon and sharpshooting is going on actively now. I was up nearly all night, riding around to the hospitals and writing orders. None of your friends have been hit yet, so far as I know.

(Note-book.) May 11. 6 A.M. A beautiful morning. Sharpshooting is going on just in front of us. Genl. Hancock rode up—he states that he left a number of his wounded on the field by Genl. Barlow falling back from his position across the river before any ambulances could get up. When the 5th

[1] Thomas G. MacKenzie, Medical Officer, United States Army, 1861–67.

Corps Hospital was moved yesterday, the Drum Corps were deployed as skirmishers and sent through the woods to look for blankets and shelter tents with which they returned loaded. The 2nd Corps also picked up an immense number of blankets. 8 A.M. Dr. Milhau reports that 405 wounded were sent yesterday to Fredericksburg with 6 medical officers. . . . The Nélaton probe was found to work well in the 6th Corps Hospital. . . . Lieut. Sinclair of the Ambulance Corps wounded. Lieut. Guthrie also wounded. 3 P.M. A thunder shower came up, laying the dust and cooling the air in a refreshing manner. They are now loading the wounded rapidly. . . . Letter from Surgeon Pease reporting that he had arrived at Fredericksburg with his train of wounded at 11 P.M. A train of medical and hospital supplies has just been received from Belle Plain. Thousands of wounded are in the town, thousands also of malingerers. All is chaos and there is no trace of organization. The few troops there are terribly afraid of Stuart's cavalry and stampeded the wagons across the river, "but Dr. Pease prevented them.". . . Col. Schriver has gone down to organize and arrange matters. All is quiet at headquarters but picket firing is going on actively directly in front. 5 P.M. The Block House and Alsop road is to be kept clear to-night. Troops are being withdrawn from our right. All the wounded going to Silver's to-night must go by the Piney Grove Church road. . . . It is raining hard and steadily and the roads are very muddy. The rain is dropping through the old fly under which I am sitting in a very unpleasant manner.

[*Hancock's assault on the McCool salient.* (*The Bloody Angle*).]

May 12. 4 A.M. Headquarters camp broken up. 5 A.M. The wagons have gone and the staff is standing around waiting for Genl. Meade. Artillery firing is going on in front of the right and shells fall not very far from us. Several thousand of the 6th Corps are massing on the opposite side of the road 200 yards away. It is very damp and foggy. We can see but a short distance. 6 A.M. The 2nd Corps is now strongly en-

gaging the enemy. 6:15 A.M. Genl. Hancock reports that he has captured Johnson's Division, 2000 prisoners, 3 generals and 2 batteries. 6:30 A.M. Ambulances are passing rapidly to the front. 8 A.M. The engagement has become general. I rode out to find the 6th Corps Hospital, met Dr. Holman.[1] He says they have been travelling all night, having taken a wrong road—are only just come up. . . . The roads are in terrible condition. One division of the 6th Corps sent to support the 2nd Corps is just going into action. 9.30 A.M. Wounded are rapidly being brought into the 5th Corps Hospital, especially into the 1st Division, which was speedily filled. Some shelter was provided by clearing out the barns nearby and some was made of planks obtained from an old sawmill. It was raining heavily all the time and the wounded were chilly and faint. Stimulants were used freely. The supply of blankets ran short, as every man had lost his wet blanket and wanted a dry one. . . . 10 A.M. Rode to the 6th Corps Hospitals and found them rapidly filling up. As they were just pitched the ground was very wet.

11:30 A.M. Artillery firing is now going on in front of the 2nd Corps. Zouave Brigade of the 1st Division, 5th Corps have lost very heavily. This may be due to their costume, having red and yellow scrolls on the breast, making their approach through shrubbery more perceptible. Received 2 letters from Kate informing me that Genl. Stevens is dead. . . . Letter received from Surgeon General stating that 30 medical officers have been sent. 8 P.M. Dr. Milhau reports that 820 wounded are in his Hospital under shelter, many of them severe cases, some wounded with grape. 20 Rebels also received. Dr. Holman states that he has about 600 wounded. Reserve trains have been moved to Tabernacle Church. Our rations are entirely out.

(Letter.) May 12. 11 A.M. We have been doing some big fighting to-day, commencing with daybreak and they are

[1] Silas A. Holman, surgeon, United States Volunteers, Medical Division, 6th Corps.

still at it. We have beaten them very badly and propose to give them some more of the same kind. It has been raining hard all day and all last night—the roads are in frightful condition. I am well and have escaped even a graze. I have only been exposed to fire three or four times during the whole battle. I have done a great deal of work within the last eight days and have learned many, very many, things. I have been everywhere and seen everything and have a large note-book full of the memoranda which I make as I go about, which note-book will be a very interesting thing for you one of these days.

(Note-book.) May 13. 7 A.M. Report received from Dr. Smart[1] that 1820 wounded were received into the Hospital of the 2nd Corps yesterday and were all cared for. Order issued that the wounded be sent to Fredericksburg to-day if wagons and ambulances can be collected. One day's rations to be sent. . . . I sent an order to Dr. Pease[2] to send back all the cavalry ambulances. Sent all the headquarter spring wagons to report to Dr. Dougherty. Sent Steward McFarland to the train for blankets, etc. Sent letter to Surgeon General notifying him of the present status of things. Order received from Genl. Meade that all staff officers must be always ready to march at daybreak. Rode with Dr. Ghiselin[3] to the 5th Corps Hospitals; found that they had been ordered at two this morning to load up their wounded and after keeping them 2 hours in the ambulances in the cold grey of the morning, the order was rescinded and they are now unloaded. Much suffering resulted from this. Saw Capt. Lowe[4] of the 11th—made him as comfortable as I could. Corporal A. R. Munro, Co. B, 11th U. S. Infantry; gunshot wound of left elbow joint; removed condyles of humerus with chain saw, also the upper 1½ inch of the [fore] arm. 10 A.M. Dr. Holman reports that he has 1200 wounded in his Hospital. Capt. Jones A. Q. M. who

[1] Charles Smart, Medical Officer, United States Army, 1864–1905.

[2] Roger R. Pease, surgeon, United States Volunteers, Medical Division, Cavalry Corps.

[3] James T. Ghiselin, Medical Officer, United States Army, 1854–74.

[4] William B. Lowe, Captain, 11th Infantry, 1861–64.

went in charge of the first train of wounded reports that 17 ambulances have had the horses taken by Mosby. . . . 4 P.M. Asst. Surgeon C. Lee arrived with dispatches from the Surgeon-General, from Surgeon J. H. Brinton and from Dr. Dalton. Every article of supply which can possibly be wanted is now at Fredericksburg, except stretchers and medical officers. Our wounded are being rapidly brought in from the Wilderness and supplies have been sent to them. Dalton thinks there are about 1500 there. . . . Orders for march received. 5th Corps to pass to left and get on the Gale[1] road. 6th Corps to go to the Massaponax Court House road. Trains to go to Salem Church. Attack to be made about daylight if possible.

May 14. Headquarters moved at 3 A.M. It has been raining all of the morning and the road is frightful. Dr. Milhau says at 4 A.M. that he has left 400 wounded with 4 medical officers and the greater part of his tents. The doctors have been working all night and the whole arrangement is stuck in the mud about ¼ of a mile from here. 7 A.M. Genl. Meade and staff are now at what is called the Beverly House on the Fredericksburg and Spottsylvania road about 2 miles from Spottsylvania Court House. It is a large frame house with a portico facing southwest, looking over a broad valley, in which the troops are now formed in line of battle. About 2 miles distant south by west is another large house, where the Rebel pickets are and also a section of artillery which is now playing on our cavalry. We rode over with Genl. Patrick, following the telegraph wire. Wagons and artillery crowd the road and are mired in many places, mud being over the hub in some places. We passed several wagons filled with wounded which were stuck fast. 9 A.M. Genl. Grant and staff have just arrived. . . . 10:15 P.M. Dr. Milhau telegraphs that he is informed by Genl. Hancock that the Rebels entered the 5th Corps Hospital this evening and carried off all attendants who had no badges. 270 wounded left in hospital. Answered:

[1] Given in Gilmer's (C. S. A.) map as "Gayle."

That he is to send to-night his ambulances and temporarily emptied army wagons and remove his wounded before the guard is taken away. (One regiment has been sent there by Genl. Hancock.)

May 15. 1 A.M. Dr. Milhau replied that his ambulance train is 4 miles back and that he cannot bring away the wounded to-night. . . . Gloomy morning and cold. 8 P.M. No movements of the army have taken place to-day. It rained heavily during this afternoon. Our reserve wagons came up this evening and we proceeded to make ourselves comfortable. . . .

May 16. 9 A.M. All is quiet this morning. Genl. Williams said in passing by that J. E. B. Stuart is killed. . . . Pvt. Benj. Turner, Co. "G," 19th Ind., 41st Div., 5th Corps, was taken on the 5th of May. Went to a hospital on the turnpike 2 miles east of Robinson's Tavern. A small house, hospital, and wall tents and flies were up, 30 or 40. About 250 of our wounded are there, all of the Rebel wounded were taken off, our wounded were cared for. Two Rebel surgeons were left with our wounded; flour, corn meal were left with them. On the 13th hard bread, coffee, and sugar, and fresh beef and tents were brought to them by a flag of truce. Two of our doctors are there now. He left there the night of the 13th. Some of our wounded are reported as being at Robinson's Tavern; 15 attendants are there. The Rebels left two tents. Our dead have been buried. Col. Mansfield of the 2nd Wisconsin is there, also 1 Major. 14 qt. kettle to cook for 150 men. Some hogs were killed which enabled them to get along. Few or no dressings were on hand. Anæsthetics were used by the Rebel surgeons. The wounds were doing well. 2 P.M. Arrangements are being made to send for all the wounded left at Cossins and other points. General Gibbon with his Brigade goes to superintend the affair. I sent all the headquarters spring wagons. Over 200 ambulances were sent and 50 army wagons. . . . Genl. Meade states that the Aquia Creek R. R. will be open in 12 days. 9 P.M. No fighting to-day.

(Letter) May 16. 9 A.M. Near Spottsylvania Court House, Virginia. It is very quiet this morning, not a gun having been fired yet. . . . Yesterday and to-day the Army has been resting, being almost exhausted by fighting and struggling through the mud and rain. We have sent about 18,000 wounded off. I am sitting now by a big fire in front of Dr. McParlin's tent. A dense fog is covering everything, just in front of me is a narrow strip of dense woods and in front of that are our batteries, posted along the crest of hills which command the Ny River, distant about half a mile. Dr. McParlin will do almost anything I ask of him. While we are resting, I am writing up my records. I enclose in this letter a bunch of violets which I picked close by where Genl. Sedgwick was killed. Very many of my old friends have been killed and wounded but none that you know I believe, except Captain Brightly[1] of the 4th, who was wounded but not severely. I suppose we are going to move to-night or to-morrow.

(Note-book,) May 17. 8 A.M. Dr. McParlin rode to Fredericksburg this morning. Report of Dr. Phelps for the 16th instant received at 5 P.M. . . . He reports that the field surgery of the battle is of a high order. 388 crossed the pontoon bridge to-day. There are now in the hospitals 6934 patients. Erysipelas is beginning to make its appearance. Note from Dr. Cuyler[2] to Dr. Phelps[3] transmitted, stating that since he came to Belle Plain, he has been shipping over 1500 per day; that they arrive in very bad condition owing to the very bad road between Fredericksburg and Belle Plain. . . . Dr. Jones[4] died on the evening of the 14th. The morning is damp and cool. 9:30 A.M. Headquarters ordered to break camp and move to the Anderson House. . . . Rode to the 2nd and 6th Corps Hospitals, which are west of the pike and north of the Massaponax Church Road. Rode up to the

[1] Charles H. Brightly, Captain, 4th Infantry.

[2] John M. Cuyler, Medical Officer, United States Army, 1834–82.

[3] Alonzo J. Phelps, surgeon, United States Volunteers, inspector at field base.

[4] Thomas Jones, surgeon, 8th Pennsylvania Reserves.

Anderson House and found the staff there. Rode back to 5th Corps Hospital, which is between our headquarters of last night and the Beverly House, in a little open space in the woods. The enemy's works can be plainly seen through an open space in the trees across the river. Dr. Holman moved his Hospital to the Anderson House on the 14th but was shelled out, losing several mules and one driver. Rode back and found headquarters established in the edge of the woods. . . . The red breeches[1] are now (2 P.M.) busily engaged in pitching tents and clearing the ground.

May 18. Headquarters broke camp at 4 A.M. and moved to what is known as the Deserted House. The 2nd Corps engaged the enemy about daylight. 2nd and 6th Corps Hospitals were broken up last night and the wagons and ambulances were in train ready to move at 5 A.M. The roads were full of deep ruts of miry and tenacious clay making movement very difficult. A few shells were thrown into the vicinity of the 5th Corps Hospital. At 9 A.M., Genl. Meade expressed a wish that all of the Hospitals should be on the east side of the Spottsylvania and Fredericksburg turnpike. The 2nd Corps Hospital had by this time got almost up to the Deserted House. I rode to all the Hospitals giving them the necessary directions. The Deserted House is now merely a chimney and a wall on a high knoll which commands a very good view across the Ny River. One battery of Parrott guns is planted by its side. The staff are sleeping around on the ground. 1 P.M. Report received from Surgeon Phelps (for the 17th) that 6776 wounded are now in Fredericksburg. The day is warm and pleasant. 4 P.M. Rode with Dr. Ghiselin to the 6th and 2nd Corps Hospitals, found that they were rapidly sending off wounded to Fredericksburg. Dr. Asch[2] and myself now occupy one tent.

(Letter) May 18. 1 P.M. We have had a little fight this morning, losing about 300 men. I was up at 3 o'clock A.M. and have been riding about the country until about an hour

[1] New York Volunteers (Zouaves).

[2] Morris J. Asch, Medical Officer, United States Army, 1861–73.

ago, moving the hospitals and hunting up information. Headquarters during the forenoon was at a spot called the Deserted House, one of the most desolate places I ever saw. Just a chimney and one wall remaining of what had been a most beautiful Virginia mansion, a battery planted right among the ashes, and silent woods all around. Artillery firing is still going on at spasmodic intervals but the fighting seems to be over, though there is no saying what an hour may bring forth.

[*Ewell's attack on Tyler's Division.*]

(Note-book) May 19. Cloudy morning. . . . Our wagons are again sent to the rear to-day. 4 P.M. Thus far it has been sunny and pleasant—no fighting. Capt. Parker, A. A. G. on Genl. Grant's staff informed me this morning that Genl. Grant had sent a letter to the commanding officer of the Confederate forces, to be sent by flag of truce, requesting that our wounded who are now in the Wilderness be given up, and stating that the Confederate wounded would be given up at Chancellorsville if it was desired. 5 P.M. Just as we were eating dinner, we were surprised by a rattle of musketry on the turnpike just behind us. In a moment more Genl. Grant passed quickly by the open fly in which we were sitting and joined Genl. Meade. After a moment's consultation, the 2nd Corps was ordered to move to the right. Everyone had their horses saddled. After waiting 15 minutes and learning nothing, I got on my horse and rode out to the turnpike. The 2nd Corps were forming line of battle a hundred yards beyond. After waiting a little I came back and learned that Ewell's Corps had crossed the Ny River near the Deserted House, came up by the Harris House, and made an attack on the wagon train which, contrary to orders, was moving down the pike.

(Letter.) Last night about 5 P.M., just as we were sitting down to dinner which consisted of a piece of beef, hard bread and coffee, we were very much surprised by hearing the rattle of musketry behind us in just the last position at which we should have expected it. Quite a little excitement about

Headquarters and loud calls were made for horses and orderlies. It turned out that the Rebs had come around our right flank and attacked our wagon train. They were soon beaten off, but we had 1000 wounded in the scrimmage. This was owing to the fact that our troops engaged were the heavy artillery regiments, who had never seen any field service, and they fired into each other.

(Note-book) May 20. Genl. Hancock and staff remained here last night. Was roused at 3 A.M., got up chilly and with much pain in the chest—no one else up. Morning report from Fredericksburg (May 19), 6721 wounded, 821 sick. Saw four veterans last night belonging to the 6th Corps who are just returning from furlough. One was wounded and the rest were carrying him. . . . A very scurrilous and utterly false article appeared in yesterday's *Chronicle*—that the wounded in Fredericksburg were entirely destitute of supplies, even food; also that the negroes fought desperately. All this is false. The negroes have not yet fought, except in a slight skirmish with Rosser's cavalry. 656 wounded received last night at the 2nd Corps Hospital. A very large number of these were wounded by their comrades,[1] the wounds being blackened with powder and mostly in the fingers and arms. The surgeons had brought no instruments, not even pocket cases in most instances. Almost every man when he came in from the field had an improvised tourniquet on of a twisted handkerchief etc., and much pain and inconvenience resulted in many cases. 406 wounded received in 5th Corps Hospital yesterday of which number 150 belong to 2nd Corps. . . . Day warm and sunny. Dr. Schiff, captured Rebel surgeon, was in the tent for a little while to-day. 8 P.M. No fighting to-day. Notice received from Genl. Ingalls that the Rappahannock River is now free from obstructions as far as Fredericksburg. Notified the Surgeon General of this fact per telegraph at 4 P.M. and requested that immediate measures be taken to remove the wounded. Six feet draught boats can come up. I have been very unwell all day, suffering much pain, and shall sleep in the wagon to-night.

[1] Probably self-mutilation by raw troops for malingering purposes.

[*Advance by the left flank.*]

May 21. Headquarters broke camp at 6 A.M. The wagons were sent off and the staff remained lounging under the trees. Skirmish firing going on in the direction of the Beverley House. 8 A.M. Dispatch received by Genl. Ingalls from Genl. Meigs stating that steamboats and covered barges had been started to Fredericksburg to carry off the wounded. Two large steamers are to be at Tappahannock to be loaded from the lighter vessels. All the wounded are to be taken away even if it crowds the vessels. Cavalry posted on the bluffs from Port Royal to Fredericksburg to cover the movement. 10 A.M. Headquarters moved to Massaponax Church. The staff are seated in front of the church, in the shade of three or four large trees, upon the seats brought out from the church, which have been placed so as to form a hollow square. Photographer has his tube levelled at the group from the top of one of the windows of the church. . . . The 5th Corps ambulances are passing by. 12 M. Rode to Guiney's Station, passing the 5th Corps on the road. Stopped at Motley's House, ½ mile N. W. of the station and sent the cavalry escort ahead to clear out some guerillas who were in a belt of woods just across the valley. The staff lay around in an orchard on a hill which overlooked the whole valley. The cavalry did not have much of a fight however. Headquarters camp was pitched just back of Motley's house on the edge of a little belt of pine woods. The day was hot, the roads dusty. I am to-night unable to move except very slowly and then it produces very great pain. Dr. McParlin received a private note from the Surgeon General to-day, stating that between 17 and 18 thousand have been received in Washington. They are using army wagons for carrying wounded there now.

(Letter) May 21. 6 P.M. Near Guiney's Station, Va. We have moved away from the vicinity of Spottsylvania and have crossed the Fredericksburg and Richmond railroad to-day, making a long, hot, and dusty march. I have been suffering great pain in my back to-day and yesterday and am not

able to ride now or to stand up straight. I hope it will pass off to-night. There was no fighting to-day until half an hour ago, since which time heavy artillery firing has been heard off in the direction in which Burnside is lying.

(Note-book.) May 22. Headquarter wagons ordered to move at 12 M. . . . My back is so bad that I cannot ride on horseback to-day and I am lying in Genl. Ingalls' wagon. Sent off Bradley last night for insolence and got one named Thomas Dyron, Co. K., 3rd Pa. Cav. . . . Headquarters went into camp at 5 P.M. in a large clover meadow S. W. of Mr. Stiles' House, ½ mile from New Bethel Church. Railroad opened to-day from Aquia Creek to Falmouth. . . . 7 P.M. Letter received from Dr. Breneman stating that 600 of our wounded remain in the Wilderness—that he went out on the 18th but Genl. Grant's letter was refused because it was not addressed to Genl. Lee.

[*Battle of the North Anna.*]

May 23. Headquarters ordered to move at 7 A.M. and follow the 9th Corps. The army is ordered to move at 5 A.M. sending out cavalry and infantry to find the enemy. The trains are to move to Milford Station. . . . Up to the evening of the 18th, 14,878 wounded have been received at Washington of which 899 were officers. About 1000 additional received between the 18th and 20th. 600 malingerers came up with the wounded and were turned over to the Provost Marshal. . . . Headquarters rode by New Bethel Church and halted on a green lawn in front of a large white house. At 12 we came to an old tobacco factory on a road four miles from the river connecting the telegraph roads. A Mrs. Goodwin lived in the house and three pretty girls. She said she had no one in this fight and begged to be allowed to keep an old horse which she had. Rode about a mile and found Genl. Grant at the Moncure House stretched out on the grassy lawn under one of the biggest, knobbedest, crooked and hump-backed old catalpa trees that ever was seen. The 2nd Corps train is passing in

front of the house. 3 P.M. Burnside's command is now passing. Genl. Grant issued an order to Genl. Abercrombie to go out and bring in the wounded from the wilderness *vi et armis*. 6 P.M. Took lunch with Genl. Grant's staff. Very heavy firing is now going on south, both artillery and musketry. Warren is across the river. Hancock not. Rode with Dr. Du Bois over to the old Telegraph Road to find the 5th Corps. Found the 6th Corps after riding 5 miles. As it was quite dark and the road jammed with troops and trains, turned and came back at a swinging trot through the woods, seeing guerillas every dozen yards. Found headquarters had gone into camp on the new Telegraph Road, ½ mile north of where it lay during the afternoon. Made calculation of the total number wounded up to this date, amounting to 21,684.

May 24. Headquarters ordered to move to the front at 5 A.M. Morning cool, damp and foggy. Moved to the Mount Carmel Church, a distance of 1½ miles at the forks of the Telegraph Roads. 8 A.M. The staff are now seated around in the church. Generals Grant, Meade, Humphreys, Williams, Torbert, Hunt, Ingalls, Rawlins, Col. Wilson, Burton, Babcock etc., present. Cavalry Corps heard from on our left—they crossed at the White House. Circular sent to Medical Directors to send wounded to Fredericksburg in army wagons. Dr. Dalton is directed to return all the ambulances in Fredericksburg to this army. . . . The Hospital is 1 mile from Carmel Church on the left of the road running S. E. . . . The fight of the 5th Corps yesterday evening was an attack by the enemy who had to cross an open space, our troops being in the woods. I rode with Dr. Ghiselin to the 5th Corps hospital and got a glass of lemonade and half a can of peaches. The 6th Corps Hospitals are not pitched. The trains are parked along the edge of the river. Headquarters moved across the river by Jericho Mill, a pontoon bridge having been thrown across just above the mills. The banks of the river are very high and almost perpendicular, the bed of the stream is very rocky and irregular, forming pools and cascades every few yards. 5 P.M. They are now beginning to pitch headquarters camp on the

hill by the river side, ¼ mile east of the bridge. Picket firing is going on about 1500 yards in front of us and in plain sight. The camp is partly on a road and is very dusty. At 6 P.M. a very heavy thunder storm passed by, one very sharp discharge occurring about 100 yards from camp. There is too much moving of moribund cases through mistaken kindness.

(Letter) May 24. 9 A.M. Near North Anna River, Va. Headquarters have been travelling about at a tremendous rate for the last three or four days. We are now very comfortably sitting and lying around in an old-fashioned Virginia church near Jericho Bridge on the North Anna River. We have had but little fighting since I last wrote until last night, when a sharp skirmish occurred with the 5th Corps, which is now across the river. The 2nd Corps was also in a little, losing 150 men. The general idea is that the Rebs are falling back—we are only 34 miles from Richmond now. I am getting along very well—had some trouble with my back but that is better now.

(Note-book). May 25. 6 A.M. Sky clear, air cool, very pleasant. Batteries are sliding along over the hill.

(Letter) 7 A.M. Headquarters are now on the south bank of the North Anna River, about 3 miles from Hanover Junction. There was a great deal of skirmishing and artillery firing yesterday but no battle. Our line is advancing.

(Note-book) 7 A.M. Order received that the 9th Corps report as a part of the Army of the Potomac. Closed our mess to-day and entered Genl. Hunt's mess. Headquarters ordered to break camp and move to Quarles Mills at 2 P.M. 5 P.M. Dr. McDonald,[1] Medical Director 9th Corps reported.

May 26. Raining heavily. At 10 A.M. rode to headquarters 9th Corps. . . . Orders were issued at 10 A.M. for the

[1] John E. McDonald, Surgeon, United States Volunteers, Medical Director, 9th Corps.

movement of the Army to the left along the Pamunkey. Met Lieut. Crowley[1] on my way back. He told me that one brigade lost their colours in the charge. Heavy rain at 6 P.M. Took a scalding hot bath and felt better.

May 27. Headquarters broke camp at 3 A.M. Moved past Burnside's, Hancock's and Wright's headquarters and, passing Chesterfield Station, went about 17 miles down the broad direct road and went into camp at 5 P.M. near Munyochunk Church. At least 150 dead horses were lying along the road in every stage of decomposition. . . . Just as we left camp this morning, the Rebel skirmishers came down to the opposite bank of the river, fired into the telegraph wagons etc.

[*Grant crosses the Pamunkey River.*]

May 28. Headquarters ordered to move at 7 A.M. Passed the 6th Corps wagon train, crossed the Pamunkey at Huntley's Mills on a canvas pontoon bridge and are now (12 M.) on a most beautiful lawn in front of Newton's house. . . . Day hot and dusty. Found 19 wounded of the Cavalry Corps in the negro quarters back of the house. Dr. McGuigan in charge. 3 P.M. The cavalry are now having a little fight in the vicinity of Haw's Shop and the wounded are beginning to come in. It was found best to occupy Mrs. Newton's parlours for a hospital and before I came away, 75 had been brought in, some very severe cases of shell wound amongst them. No supplies were on hand. The 6th Corps are across the river and passing to the right. The 5th Corps in front of Mrs. Newton's house, the 9th Corps not yet across, the general train is opposite Dunkirk. . . . Have not been well to-day.

May 29. Sunday: a calm, sunny morning. . . . Dr. Milhau reports 225 wounded cavalry and 35 Rebels in the hospital. . . . 30 regimental medical officers sent to the front. About 80 wounded are supposed to be accessible in the Wilderness and have been sent for. Steamer *George Weems* is now lying at the wharf ready to receive them. . . . The cavalry moved off

[1] Samuel T. Crowley, Lieutenant, 4th Infantry, 1862–66.

20189

to the left to-day. A reconnoissance found the enemy in line of battle beyond Hanover Court House. No fighting—warm and pleasant all day.

(Letter) May 29. 12 M. We are now south of the Father of all the Monkeys—otherwise Pamunkey—18 miles from White House and the same from Richmond. We have camped on a marshy sort of flat ground, not very far from the river and, it being Sunday, no movements of importance are going on. The army will advance a little in an hour to see where Lee is. Last night the cavalry had a pretty sharp fight near here, losing about 400 men. The last two days we have been on the march almost all the time and men and horses are pretty well used up. . . . In two or three days more, I suppose, we shall be on the Chickahominy and taking McClellan's campaign over again. . . . I enclose you some honeysuckle from the bank of the Pamunkey. I believe all will prove for the best for us in the end and that both you and I in years to come will be glad and proud that I was in this campaign.

[*Early's assault at the Totopotomoy Creek.*]

(Note-book) May 30. Headquarters moves at 7 A.M. Have been quite ill all night and am in a rather bad way this morning—am now taking morphine and soda. Moved to Haw's Shop. 6 P.M. Heavy firing in front of 2nd and 6th Corps.

[*Cavalry engagement at Cold Harbour.*]

May 31. A pleasant morning. . . . The 6th Corps are now on the right extending toward Hanover Court House, the 2nd Corps next lying across the Haw's Shop and Richmond road; the 6th Corps have no Hospital established as yet. It is an interesting question as to where the Cavalry Corps hospital is. . . . Firing has been going on all the morning in front of the 2nd Corps. Genl. Smith is on his way up from White House with reënforcements. . . . The 6th Corps moved during the

night to the extreme left, going into position near Cold Harbour, where the cavalry had a fight to-day, having 70 wounded.

(Letter) 4 P.M. Last evening and this morning we had a respectable little fight, and by the way the skirmishers have been picking at each other for the last fifteen minutes, I suspect there will be a little shindy this evening. We have been using artillery a good deal to-day and the Coehorn mortars—the shell firing from them last night was well done and very pretty. Our communications are now open to the White House and to-morrow morning we shall send about 1000 wounded there. . . . I am the dirtiest roughest man you ever saw—we are now sitting in a big dust hole and the sun is shining as if he intended to fricassee the whole arrangement. I think we shall hold 4th of July in Richmond, but there is no telling. Reënforcements are now coming up to us. I rather think this cruel war will be pretty nearly over by October. . . . Everybody is very good-natured, considering all things, and personally this has not been a disagreeable campaign to me at all, though I get terribly weary sometimes and getting up at 3 in the morning is not always pleasant. I came near being perforated yesterday by a sharpshooter who devoted his special attention to me for a few minutes, but his labours were in vain, I am happy to say.

(Note-book.) June 1. Headquarters moved at 7 A.M. Passing by Haw's Shop and stopping near Vince's House across Totopotomoy Creek on the Shady Grove Church Road. Rode to the 2nd Corps Hospitals and found that some cases of typho-malarial fever have already made their appearance. McGill went to Cavalry Corps—they had 85 wounded from battle of last night and they are very comfortable in an old mill on the Pamunkey River. Fighting has been going on all the afternoon—the 6th Corps endeavoring to connect with the 5th. . . . Have been demoralized all day with colic. Day hot, sultry, dust awful. Visited a very old woman with fracture of neck of femur, lying helpless in basement of house. 20 wounded in Cavalry Corps to-day.

[*First assault on Cold Harbour.*]

(Letter) June 1. Your letter of the 26th has just been handed me and gives me a very clear view of the state of things, thereby relieving me of many doubts and perplexities. . . . You must remember as you write your letters how I, away down in these Peninsular swamps, ponder over every sentence of yours and wonder what it all means. . . . Headquarters are now near Cold Harbour, not a great way from Gaines's Mill. It is fearfully hot and dusty—we had a series of little fights yesterday—not much to-day so far. Dr. Spencer is wrong about my coming to Washington, it will be utterly impossible within a month and I do not know that I can do it then except by special order of the Surgeon General. . . . I am getting tired of ham and hard bread. I hope, now that communication is open with White House, that our larder will be a little better supplied. Genl. Smith came up this morning with 18,000 fresh troops—we are within fourteen miles of Richmond and everything looks serene and jolly in the extreme.

June 2. 4 P.M. Had a heavy fight last night. 2000 wounded. We are now near Gaines's Mill battle ground.

(Note-book) June 2. Headquarters moved at 7 A.M. I rode at 5:30 A.M. with McGill. . . . Six stretcher bearers and one sergeant killed and wounded. Have 850 wounded in their hospitals on the Cold Harbour and Mechanicsville Road, ½ mile from Cold Harbour. 18th Corps wounded lying out without shelter on the side of a hill 100 yards from 6th Corps headquarters, which is ⅛ mile from Cold Harbour at Harris's house. Dr. Holman tells me that he put Dr. Sharp under arrest for neglect of 25 of the wounded. Two of his artillery ambulances were shattered by shell. He has ice & spring water, which is eked out by using the mush water for washing and dressing wounds. The wounds are shell and musketry, many of them severe; 20 cases of self-inflicted wounds of hand in 18th Corps; 40 per cent will probably be able to walk. 9 A.M. The 2nd

Corps headquarters are now with the 6th and the troops are passing by hid in clouds of dust; they have between 300 and 400 wounded whom they bring with them in ambulances. Shelters for the 18th Corps are being constructed of boughs, shelter tents and blankets. They have one beef and 250 gallons of beef stock and an order was issued by Genl. Wright that they should draw rations from any 6th Corps commissary that they can find. This order was issued last night and they have not been very energetic in hunting for supplies since many of their men have not been fed since yesterday morning. Operating is going on, four tables going. 45 wounded in Cavalry Corps to-day. Rode back to 6th Corps hospital. Drs. Bland and Taylor told me that a number of men wounded yesterday were wounded by our own artillery which was too far to the rear. At 11 A.M. orders to send the wounded to White House were received at the Division Hospital; 43 army wagons to be sent to this corps. This order was changed—a commissary issue is to be made to-night and the wounded to be sent to-morrow morning. Headquarters went into camp at 3 P.M., 200 yards S. E. of the 6th Corps hospitals. McGill has gone to the 9th and 5th Corps. 2nd Corps Hospital not established. Order to send wounded issued at 4 P.M. The trains are to rendezvous at Anderson's. It began to rain at 4 P.M. and has gone on steadily ever since. McGill, on his return, reports that 100 wounded were received into the 9th Corps Hospital; that the Rebels broke in where our headquarters were this morning and cut the wires, and that the 5th Corps Hospital has moved.

[*Second Assault on Cold Harbour.*]

(Letter) June 3. 12 M. Heavy battle this morning. 3 or 4000 wounded. All right. John.

(Note-book) June 3. Headquarters moved to the front at 5 A.M., joining 6th Corps headquarters just in front of the 18th Corps hospitals. A general attack was made by the army between 5 and 6 A.M. I rode with McGill to the 2nd Corps Hospital which is directly opposite the 6th Corps, about 100 yards

from the road. Both 6th and 2nd Corps Hospitals were loading army wagons with wounded. Nothing had been heard of the 5th Corps Hospital and considerable anxiety was felt on its account. I at last found Dr. Milhau who stated that he was ordered by Genl. Warren to place his Hospital on the Matadequin Creek, near the point where the old Church Road crosses it and that he had done so. I rode to the 5th Corps Hospitals, found them as above mentioned, tents pitched, wounded removed from ambulances and ambulances sent down the Cold Harbour road. A large number of wounded have already been brought in to the 2nd and 6th Corps. Wagons came to remove the wounded about 12 M. All the army trains are located in the angles of intersection of the Cold Harbour and old Church roads. Rode down to headquarters, meeting 5th Corps ambulances going up. Went to 18th Corps Hospital; found that their supplies are up and that they are now pitching the Hospital tent flies. Between 600 and 700 wounded of this Corps have come in from this morning's fight. There is not enough dressing going on, and more than half of the men are not yet under shelter. About 5:30 P.M., part of the staff went back to get dinner which aroused Genl. Meade's wrath and he ordered Col. Schriver to ride round and ascertain the number of wounded in the hospitals and to drive off the stragglers. By his request, I went with him, first getting a fresh horse. Came back very tired just as a sharp fight lasting about 10 minutes occurred with the 2nd Corps. . . . 750 wounded received in 18th Corps Hospital; 28 wounded in Cavalry Corps to-day.

(Letter) June 4. Near Cold Harbour, Va. 11 A.M. We had a respectable battle yesterday, losing about 5500 men, and I was in the saddle from 4 A.M. till 8 P.M., with occasional intermissions at the Field Hospitals which were scattered over a range of 8 miles. The Rebs amused themselves by throwing percussion shells at our headquarters about noon. They blew up a caisson a few yards off and knocked a small house into a pig pen, killed two men and that was all. It was raining during the forenoon, afterwards it became quite pleasant. We gained no very decided advantage—captured four or five colours and

600 or 700 men. Your note of the 25th came in last night and was the most acceptable gift I could have had after my day's work. I took it and a hard cracker by way of supper. . . . You need not have the slightest uneasiness about me for I take most especial care of myself and straggle most extensively. The dust here up to yesterday has been awful—you could hardly breathe anywhere near where troops or wagons were moving. We are getting our wounded off to White House as fast as we can. There is not much fighting to-day—the Coehorn mortars are shelling away but they don't do much except make a big noise. . . . Of course I have no idea of what is to be done next. I rather think we may move off to the left, crossing the Chickahominy, but time will show. We are busy to-day getting up ammunition and supplies. I am writing this while Dr. Ghiselin is examining a candidate for a medical cadetship. I am going to torment him now a little myself as I am the next member of the Board.

(Note-book) June 4. A foggy morning, raw and unpleasant. Breakfast at 5 A.M. No fighting during the forenoon except a little artillery firing. I remained at headquarters, took a bath, and wrote up some of my reports. 100 wagons being empty were divided equally between the 18th, 2nd, and 6th Corps Hospitals and they were directed to send off all their wounded, using half the ambulances if necessary. All were loaded and off by 2 P.M. A three days' issue of rations will be made to-night if the wagons get up in time and these can be used to-morrow. Dr. Holman came in at 3 P.M. and states that all of his [2nd Corps] wounded are off. . . . Genl. Hunt found a negro driver of an army wagon loaded with wounded galloping his team, and gave him a thrashing. . . . Nothing shows the perfection of the organization of the staff departments of the Army of the Potomac better than the fact that they have supplied two new corps, who have come up without anything. The Hospital at White House is now in fine working order; reports are regularly received. Reports from Medical Inspector Smart for 2nd Corps on 1st, 2nd, and 3rd of June received. He says they have still a number of wounded on the

field whom they cannot bring off as they are covered by the Rebel sharpshooters. 7 P.M. It has been raining gently for 2 hours. Firing heard on the right. Report received at 9 P.M. from Dr. Milhau that 420 wounded [5th Corps] have been sent off to-day—has none left. 6th Corps have sent off all their wounded.

(Letter) June 5. 4 P.M. To-day being Sunday, the troops are resting, while we of course are working harder than ever. I got a train of 200 wagons off this morning for White House loaded with wounded, have written about fifteen official letters, and feel tired but well and exceedingly jolly, as your letter of May 28 has just come and gives the brightest view of things I have heard from you in a long while.

(Note-book) Raining and cool. Rode to 18th Corps Hospital, found that they have about 60 amputated cases to send. . . . Rode down to 9th Corps Hospital which is just back of Woody's, about ½ mile from front. Saw Dr. Adams who says that they have got off all their wounded. Rode back to 18th Corps Hospital. Nearly all the wounded in this Hospital are now under shelter: Hospital tent flies are attached together and pitched low, forming very excellent long field wards—the sides fastened to racks two feet from the ground and the interval closed with bushes. . . . Wrote letter to Genl. Williams regarding the sanitary state of the Army and urging that an immediate issue of vegetables be made. . . . Our cavalry are now holding the Chickahominy crossings but will be withdrawn to-night. The 5th Corps moves from right to left to-night. . . . Very heavy firing was heard on the left about 8 P.M. and the flashes of the guns came out in strong relief against the dark cloud which formed the background.

June 6. A sunny morning, cool and very pleasant. . . . The old 2nd Division [5th Corps] under command of Genl. Ayres has been reorganized. At 9 A.M. a circular was received from Genl. Meade stating that application has been made to Genl. Lee for a cessation of hostilities to-day from 12 M. to

3 P.M. for the purpose of collecting our wounded and dead. A flag of truce was sent out by the 2d Corps last night but no answer was obtained. Circular received from Dr. McParlin ordering a daily report from the medical officers at these headquarters. 3 P.M. Report received from Dr. Suckley[1] stating the total number wounded in the 18th Corps from June 1st to June 6th to be 1556, of which number 1155 (46 officers) were sent to White House. . . . The cavalry start to-morrow morning; they take 16 ambulances and 1 medicine wagon, leaving all their tents (40) ambulances (56) and hospital stores at White House. The railroad at White House is being repaired. . . . The Rebs shelled headquarters 6th Corps and the field this side very vigorously about 3 P.M., causing a great scatter among wagons, etc. About 8 P.M., musketry was heard and half a dozen bullets whistled by.

June 7. Cool and cloudy morning. . . . Complaint made by Corps quartermasters that great delay occurs in loading and unloading wounded from the wagons. Rode with Dr. Ghiselin to White House—road very good but some bad spots in the valley and especially after crossing the railroad. . . . Saw negro guards with muskets, etc., in the wagons, also 2 men playing cards on horseback. [Here follows a long statistical record of an inspection of all the hospitals with pertinent criticisms of their deficiencies]. Returned, reaching camp about 8 P.M., very tired and used up. The cessation of hostilities took place between 6 and 8 P.M., but all of our wounded were dead and were buried between the lines where they fell. Three Divisions of the 5th Corps have gone down to Sumner's Bridge. No fighting today.

(Letter) June 8. There has been no fighting for two days except an occasional picket shot. Yesterday there was a cessation of hostilities for two hours for the purpose of bringing off our wounded and dead. All the wounded having died before we could get them, and the dead being in no condition for removal, we buried them as they lay. I rode to White House

[1] George Suckley, Surgeon, United States Volunteers, 1861–5.

yesterday—a distance of 11 miles—inspected the Hospital arrangements and got back by 8 P.M.—a good day's work, was it not? . . . I think we shall move down to the James River within a week; when we do, everything will come straight to us and we can be as comfortable as in winter camp almost. Lieut. Crowley has been shot through the arm—not badly I think. Col. McMahon's brother was killed and was found among the dead yesterday.

(Note-book) June 8. Worked all the morning at my report of yesterday's inspection. No fighting up to 1 P.M. A cool, cloudy, pleasant day. A correspondent of the *Inquirer* was paraded along the lines to-day with a trumpeter blowing before him and labelled "Libeller of the Press." . . . Received specimen of bad surgery from Dr. Adams to-day. Railroad is being torn up between Despatch Station and White House. Fighting now is mostly skirmishing. Three men start, 1 carrying rails, another muskets, another hoes, run forward and build a breastwork in about 5 minutes.

June 9. Received box of blanks from S. G. O. most of which are entirely useless. Morning warm and clear, dust beginning to rise again. Rode to 9th Corps Hospital. . . . 1st Division contains some typho-malarial cases,—red, glossy tongues, abdominal tenderness, etc. . . . Fractured femurs are usually dressed with Smith's splint placed posteriorly. . . . Rode to 1st Division, 6th Corps Hospital. All right. Rode to 1st Division, 5th Corps Hospital, just fitting up. Stopped at headquarters 5th Corps, had a talk with Dr. Milhau. Sickness prevalent among the new troops. . . . No fighting to-day. Col. Schriver, returned from White House, states that the 9th Corps Hospital have buried their dead in the street about two feet deep. 800,000 rations issued on June 7.

(Letter) June 10. 2 P.M. My letter has not come yet with the postage stamps in it and I am afraid this will not be sent until it does, for I can't find anybody who has any. We have had no fighting and have not moved camp since June 8.

. . . Genl. Lee has very strong lines of works in front of us here and I do not think Genl. Grant will try to besiege him out of them, although a siege train of heavy artillery is now coming up. The cavalry has started on another raid, probably going toward the north of Richmond. We are living in very good style now—there are sixteen of us in a mess. . . . It costs about $45.00 a month. I think I shall get up to Washington some time in August—I hope so at least. My health is very good and I have very pleasant companions. I like my work also—it is very laborious but very pleasant. I watch and wait for your letters—they do me good and enable me to work and to do my duty better. My choice time of thinking about you and Birdie is just in the gloaming, when the band is playing. I lie and listen to it and to the occasional picket firing and wonder where and how you are.

(Note-book) June 11. Rode to 3rd Division, 2nd Corps Hospital. Trouble with Genl. Hancock about medical officers being at the front. This conflicts with Dr. Letterman's order. Genl. Barlow orders chaplains to accompany their regiments. . . . The Division Hospital Commissaries are usually inefficient—those officers who are useless in the field being usually selected.

(Letter) Another day has rolled off without any fighting, the Band has just finished its evening serenade to which I have been listening while smoking my after-dinner pipe and thinking about you—and calling up old memories of Cliffburne—and West Philadelphia and Bedloe's Island, pleasant memories all of them—sunny spots in my life. Perhaps now you are wondering what I am doing, and what it is that keeps me busy. I got up this morning at 6 o'clock—ate breakfast—got on my horse and started for the 5th Corps Hospital distant about a mile. When I got to the spot where it had been I found that the whole Corps had gone off—having moved down the Chickahominy. Then I took a short cut through the woods to the 2nd Corps Hospitals—got into a big swamp covered with underbrush but finally succeeded in reaching them. I found them

pitched on a lawn in front of a house—once a fine old mansion but now fast going to destruction. The 2nd Corps has three divisions—and each Division has its own Hospital. Each Division has 22 hospital tents with the flies.

A fly covers each interspace between the tents. Pine boughs are strewn thickly in the tents for beds and there are plenty of blankets. I went around to all the Hospitals—saw the doctors—inspected things in general—and then rode to the 6th Corps Hospitals—about a mile off and examined them in like manner. I got back here at 1 o'clock just in time for lunch. Then the Medical Inspector of the 9th Corps came in with some reports and a number of questions to be answered. I directed him to make me a written report on the quality of the liquors furnished the Medical Department. I then wrote out a report of my inspection and devised a new plan of transportation for the Hospitals. The Medical Director of the 6th Corps came in and I had a long talk with him. Then the mail came with about 20 letters of different kinds to be attended to. No letter from you though. Then came dinner—and then Dr. McParlin who has just returned from White House—and he had a bundle of papers to be noted. And then I went into my tent and lay down on my stretcher and listened to the music. We are expecting to move every hour about now. I keep well I am glad to say. We have fought this last battle in a very funny way, having dug our way through it. Three men will start out together on the skirmish line—one carrying the three muskets—the other two some rails and two hoes. They run forward as hard as they can for 100 yards—they drop on their faces—pile the rails in front of them and reach over with the hoes and pull up the dirt against the rails—the whole thing is done in five minutes. Then they dig a little pit to put their feet in—and there they stay exchanging shots with the Rebel skirmishers who will be about 50 yards off. They put up their hats for each other to shoot at—and play all kinds of tricks. To-morrow morning Brady is going to take a photograph of all the officers at Headquarters in a group. You may be able to purchase one of them by and by.

[*Crossing the Chickahominy.*]

June 12. 2 P.M. We leave in an hour for the James River—the Army moves to-night. We cross the Chickahominy at Long Bridge and go thence to Charles City Court House.

(Note-book) June 12. Warm and windy. Clouds of dust flying. Orders for march received. The 6th and 2nd Corps to withdraw to-night to the rear line of intrenchments. The Army crosses by Long and Jones Bridges. Trains at Windsor Shades. Depot at White House to remain until Sheridan and Hunter arrive. Nearly all the sick and wounded are gone from White House—all will be gone to-day. 11,363 have been admitted in all up to June 11. Headquarters moved at 3 P.M. by Tunstall's Station to Moody's where 5th Corps headquarters are. Rode over to 5th Corps Hospital, just by Providence Church—found them packed and ready to move. . . . Went into camp near Moody's at 11:45 P.M. Wagons did not come up and we lay on the ground.

June 13. Headquarters moved at 5 A.M. Reached Long Bridge at 7:30 A.M. Found 2nd Corps headquarters on the north bank. This corps moved at 10 P.M. last night—15 ambulances to each division; the rest of the hospital train went to Tunstall's. Listened to interesting conversation between Dunn, Grant, Meade, Hancock *et aliis;* rode through the Chickahominy swamps and marshes until 4 P.M., passing all infantry until we came to the cavalry picket at Clarke's, one mile from the James River. Went into camp at 6 P.M. in a large clover field near Mr. Christian's. The 2nd Corps came to Clarke's by 6 P.M. The 6th Corps got across at 6 P.M.

[June 14–15: *Crossing the James River.*]

June 14. A damp cool morning. . . . 1 P.M. 40 men wounded in cavalry yesterday. 2nd Corps are now crossing by transports from Wilcox's Wharf.

(Letter) June 14. 10 A.M. Yesterday we started at 5 A.M., having had just 3 hours sleep, and made a long round-about march through the Chickahominy swamps, coming into camp at dark in a large clover field near Charles City C. H., where we are now lying. The James River is two miles distant. A good night's rest and breakfast of broiled chicken revived me, and when Captain Bates handed me your letter—and in less than ten minutes the mail came bringing the magazines, why I was as right as I could be. Postage stamps are peculiarly acceptable. . . . So you see I am very jolly. We are going to have good times now, being on the James River—mails will be regular and we can get whatever we want. We shall cross to the other side of the river in two or three days. No fighting yet. Send me the July magazines when they come out. . . . I hope Alex will succeed in getting that tobacco down for I have not had a decent smoke for three weeks.

(Note-book) June 15. Hot; roads dusty. Rode down past Tyler's Mill to the pontoon bridge which was laid last night; it has 96 boats and is 2060 feet long. The 9th and 18th Corps ambulances are across and in park, full of sick. A few cases of scurvy have been noticed. The 6th Corps train is in park near Douthert's. Headquarters moved at 10 A.M., going into camp at 12 M. at Douthert's in the clover field on the bank of the James. The depot boats passed up the river at 12 M. Reserve trains were crossing the Chickahominy this morning. Found I had got into a quarrel with the 9th Corps—got out again. Went down and took a bath just before dinner; water was so muddy that I came out saffron colour. Orders for the march to-morrow received at 8 P.M. The 9th Corps goes to the left of the 2nd, the 5th to the left of the 9th, while the 6th Corps defends the bridge.

[*Assault in front of Petersburg.*]

June 16. Headquarters broke camp at 8 A.M. The general train is now crossing the pontoon bridge. 6th Corps Hospital available now. Rode out with McGill, going slowly as I feel

quite sick. Rode with Gillespie,[1] overtaking the 9th Corps near Old Church. Found 2nd Corps 3rd Division Hospital at Dr. Ryan's house. . . . Headquarters went into camp 100 yards from Hospital. 9th Corps need wagons extremely. The drum corps are removed and attendants are very scarce. A general assault was ordered at 6 P.M. and the firing is very heavy. About 1200 wounded in the 2d Corps Hospital at 12 P.M. A beautiful moonlight night. Burnside was ordered to make an assault at 10 P.M.—at which time the staff came in—but he was all night doing it.

June 17. 5:30 A.M. Dispatch from Gen'l. Burnside that he has captured 5 guns and 550 prisoners. Headquarters moved to the front at 6 A.M., joining Gen'l. Hancock's headquarters. 7 A.M. Generals Warren and Burnside came up. Gen'l. Warren is on the Prince George Court House road. 1 P.M. Have been lying here in the dirt while McGill and Gibson have gone out. Gen'l. Meade ordered his camp moved this morning, although his Adjutant and Inspector Generals informed him that no other place could be found where water could be procured. 9 P.M. But little fighting during the day. We are just going in to get our dinner. Day very hot and sultry, no wind, dust very heavy. Rations of whisky, potatoes and pickles issued to the troops.

(Letter) In front of Petersburg, Va., June 18, 9 A.M. We had quite a fight yesterday and day before, capturing guns, prisoners &c., our loss being about 2000. The weather is hot and sultry and a fine sand dust fills the air. The flies are getting very savage and persecute our horses very much. We crossed the James River on the largest pontoon bridge ever made in America, being 2060 feet long. Our Depot is now at City Point and boats of all kinds are rapidly arriving there. I keep pretty well and scratch this off in a hurry for I have got to go and see about getting off our wounded.

(Note-book) June 18 (Saturday). Headquarters moved to the front at 4 A.M. We now hold all the approaches to

[1] George I. Gillespie, Engineer Officer, United States Army, 1862–1904.

Petersburg. . . . Dr. McCormick[1] [Med. Div. Army of James] sent despatch offering the use of some of his hospital transports. Rode to City Point, found all the depot boats just up and everything in confusion. Received orders to go to Washington in charge of the first boat load of wounded. Found Asch, Mackenzie and others on board the *Planter*. Heavy cannonading in front all day. Hospital transport *George Leary* reported [from the Army of the James].

June 19. Warm and sunny. Worked all day loading the *George Leary* with wounded and set sail with her at 6 P.M.

June 20. Arrived in Washington at 6 P.M. went home—found all well.

June 21. Saw Dr. Abbott and the Surgeon General.

June 22. Went on board the *Keyport* at 2 P.M.

June 23. Reached City Point at 3 P.M. Found that the barge *New World* is useless.

June 24. Rode to Headquarters which are near Jones House. Day very hot and dusty. Found that in the attack of the 22nd about 2000 of the 2nd Corps and 500 of the 6th Corps were captured with 4 pieces of artillery. A siege train is now at City Point and will soon be brought up. I find that officers begin to be somewhat despondent. It is very desirable that we should have a marked success of some kind now to cheer up the Army. Our losses in this campaign thus far are about 63,000. The cavalry have not yet returned. Headquarters are now near Jones House on the plank road.

(Letter) June 25. I reached Headquarters yesterday—found them south of Petersburg and west of the Norfolk and Petersburg R. R. There has been no fighting for two or three days. Lee outflanked the 2nd Corps three days ago and captured 2000 prisoners and 4 guns. (I don't think there will

[1] Charles McCormick, Surgeon, United States Army, 1837–77.

be any more great battles for some time.) It is fearfully hot—and as to dust—Lawk! don't mention it. I am very busy writing up reports and trying to make up for lost time and I only pencil this off that you may know where I am. My trip to Washington has taken off an immense load of the blues which I was carrying, and I feel pretty cheerful. My leg is quite numb and I do not intend to ride on horseback for a week or two but shall stay in the shade and make myself comfortable.

(Note-book) June 25. A very hot and sultry day, and the roads a perfect Avatar of dust. No fighting seems to be going on. I have had a fly pitched for my benefit. My left leg is almost useless to me and I shall stay in camp and do office work. . . . Made calculation of number of wounded in the late fights.

[Omitting details] Wounded to 23rd June, 44,499
Of these 454 were officers.

Number of sick sent off	3,000
Probable number killed	7,000
Probable number missing	12,000
Total	66,499

June 26. Hot as ever. Skirmishing in front of the 5th Corps all night. Thermometer 103°. Order issued from general headquarters that six medical officers from each corps be detailed to duty at City Point. Dalton telegraphed that no transport steamers have appeared for 48 hours—that the hospital is crowded, having 6,000 patients, that it is 105° in the tents and very dusty. Dr. H. Porter, with an artist from the S. G. O. came in to-night, also Dr. Robertson of the British Army. A part of our siege train is now being put into position in front of the 9th Corps. Some mining is also being done in the same place.

June 27. Not quite so hot but windy, and dust flying in clouds. Gen'l. Gibbon's Division moved to the left and rear to protect our train against a threatened incursion of cavalry.

My leg is very numb and I have to lie down the greater part of the time. A gentle rain began about 5 P.M. Steamer *T. A. Morgan* left City Point for Washington with 239 wounded.

(Letter) June 28. For two days it has been hot, uncomfortably hot, infernally hot, but this morning it is tolerably pleasant. Hampden Porter is at headquarters now, having come down night before last with an artist to get some sketches for the Army Museum. He will remain a week or ten days. We hear no news here, there has been no fighting except occasional skirmishing for the last three days. Our siege train is now being put into position and will be ready to open in a day or two. . . . I have not mounted my horse since I got back. My left leg is pretty numb and useless so I keep in my tent and have been writing up my reports. We hear all kinds of rumors about reënforcements coming but there is nothing positive yet; meantime every one keeps as cool and does as little as possible.

(Note-book) Somewhat cooler. . . . Captain Newhall of the Cavalry came up to-day—says that Gregg had a pretty heavy fight at St. Mary's Church, having about 350 wounded which were sent directly down the James River, also that 350 were wounded at Trevilian Station.

June 29. Comparatively cool and pleasant. Report current that 3rd Division of cavalry under Gen'l. Wilson, which has been out destroying the Weldon and Danville railroads, has been cut off. The 6th Corps moved out to effect a diversion.

June 30. Report confirmed of Wilson's trouble, also that he lost 3 batteries and nearly 1000 men. Day windy; dust flying in clouds. The 6th Corps are lying 8 miles away.

(Letter) The hot weather has been succeeded by two very cool and pleasant days, which I have enjoyed by lying in my tent and reading anatomy, whereby I feel much better and rather jolly. The siege of Petersburg goes on well but slowly;

our cavalry had an ugly loss yesterday the full particulars of which are not yet known, but probably it will amount to 1000 men and 3 batteries. Our camp has not been moved since I got back and it has evergreen bowers built all over it and all around it. Ice is plentiful and canned peaches occur every day. . . . I should be sorry to leave the field just now, even if I could, for this is the greatest campaign of the war, and it will be a proud thing to say that I saw it all and was in every battle. . . . Headquarters are going to move to-morrow over towards the James River again, but will not go more than two or three miles. . . . I don't think (this is a profound secret) that the tone of the Army is as hopeful as it was two months ago—everybody seems to be tired and discouraged. They must be suffering a good deal of privation in Richmond now, but I presume that most of the women and children have gone.

(Note-book) July 1. Dust as usual. Shell firing all night. Thermometer 103° in the shade; no wind. 6th Corps have returned to their lines. Report at night that Wilson's cavalry is coming in.

July 2. No cloud in the heavens, but a little brceze renders the heat less insupportable. . . . Evergreen bowers have now been built over most of the tents here, and with ice, lemons, etc., we get along very well. The men in the trenches suffer much. I have not yet moved 20 yards from my tent but I am going to try it to-morrow.

July 3. A calm, cool summer night last night, with just enough firing to break the silence agreeably. . . . Rode to 1st Division Hospital, 5th Corps, found that they had just sent off 100 sick who had been collecting for a week. Flies are very troublesome. The news of Chase's resignation and of Fessenden's appointment came to-day and has been the cause of considerable discussion. Sheridan is now at Prince George Court House. The 4th Division of the 9th Corps (negroes) are lying near the crossing of the Blackwater and the Norfolk R. R. No fighting. Day hot and sultry.

July 4. Monday. Cool and cloudy, raining a little. The band serenaded us at reveille with some of the national airs. Our food for the past week has been very poor, the meat being all tainted. No firing during the day.

July 5. Tuesday. Dust and heat as usual. Congress probably adjourned yesterday. Gen'l. Ewell has gone up to Martinsburg and has probably by this time struck the Baltimore and Ohio Railroad. The Flying Dutchman, as Sigel is called down here, has probably done nothing to check him. No fighting.

(Letter) July 5. Another long hot day is nearly over and while I am waiting the summons to dinner, I will commence this letter to you. Cannon have been booming at intervals all day but there has been no fighting. . . . Every night the band gives us a serenade and then the mail comes in so that the pleasantest part of the day is really between seven and eleven P.M. Dr. Ghiselin and myself are now tenting together; for bedsteads we use two stretchers from one of the ambulances; we have evergreens planted all about our tent and the floor is freshly strewn every morning with small pine boughs; the sides of the tent are looped up and so we manage to keep pretty cool. Nothing will keep out the dust, it is true, but it certainly must rain before very long. The flies are rapidly increasing and will be the chief pest during the next two months I presume. We are getting some fresh troops daily, and, now that the $300 clause is stricken out, I hope the coming draft will produce a goodly number. Everybody along the lines is fortified; the surgeons at the front have their hospitals protected by breastworks, and covered ways and trenches are dug so that food can be taken to the soldiers in the works without danger. I wish now more than ever that I knew how to sketch a little so that I could give you some idea of the position of things. Have you commenced the Herculean labour of arranging my papers yet? Poor child! I can fancy the expression of despair that will come over your face when you look at them. . . . I see that the new tax bill is passed—

don't expect another silk dress for three years at least Mrs. B.! As for myself, I am going to wear soldier's clothes after this—just think of $115 for a uniform suit.[1] The Southern ladies, at least those whom I have seen, dress in very cheap, coarse, strong dresses; they are neatly made, it is true, and do not look as badly as you might suppose.

(Note-book) July 6. Rickett's Division of the 6th Corps starts to-day by transport to meet Ewell. Burnside's mine progresses but slowly. No fighting to-day. Received report of the late cavalry expedition from Dr. Pease. But 4 ambulances were taken with each division besides the two with headquarters. The whole number of wounded is 774, of whom 526 were wounded in the fight at Trevilian Station. . . . I have been working to-day on the statistics of the battle of the Wilderness but have not yet succeeded in putting them into any definite shape.

July 7. Dust and heat as before. News received of Ewell's raid into Pennsylvania.

(Letter) July 7. There has been no fighting lately and everything goes quietly and smoothly on. I lie in my tent and keep cool; have been working at the reports of the battle of the Wilderness for the last three or four days. . . . You read the accounts of Ewell's little raid I presume—one division of the 6th Corps has been sent up to stop him. I don't think he will get very far but he will undoubtedly do a great deal of damage in the places where he does go. It will be queer if we find ourselves all up near Manassas again in about two months. . . . We have been firing a shell into Petersburg about every fifteen minutes to-day—otherwise all is quiet.

July 8. Very hot: 110° in the tent. I have been quite sick all day, but have worked on reports. . . . Water tanks are now in operation at City Point.

[1] At this time his total monthly pay in the field was $121.83.

(Letter) July 9. I have just had my dinner, the sun is setting, everything is cool and pleasant, with the exception of the dust—and of six flies who are especially desirous of alighting on my nose. . . . I need hardly tell you that there is nothing new. Yesterday the Rebels made or rather tried to make a little attack upon our right but failed, and to-day all has been peaceful. Dr. Ghiselin brought a box of oranges up from City Point last night and I have been enjoying them all day in conjunction with a novel called *The Greatest Plague in Life*. What do you suppose it was? . . . As to going into the country, I would not do it if I were in your place. I have always thought it was a very foolish thing to go into the country to avoid heat. I would rather be in a three-story house in the city. . . . I see that the President has proclaimed martial law in Kentucky. What astonishing reports must be prevailing in Washington and Georgetown just now with regard to the Rebel invasion. Of course you do not disturb yourself. Here comes the band for its usual evening's performance and it has now commenced with Schubert's Serenade.

(Note-book) July 10. Sunday. Very quiet all day. No news. The 4th Division, 9th Corps, have taken the place of the 6th Corps on the extreme left.

July 11, 8 P.M. Very hot all day. A heavy storm is now coming down from the North. Very bad news from Maryland this evening. Wallace is defeated and Gen'l. Tyler is captured.[1]

July 12. It rained just enough last night to lay the dust and it is cool and pleasant for an hour or so. Headquarters moved at 8 A.M. to a point 100 yards in rear of the 9th Corps Hospital; the new camp is on a knoll covered with pine trees.

[1] Engagement with Ewell's Corps on the Monocacy which, although a technical defeat for Wallace, detained Ewell so long as to make Washington safe, as was Wallace's hope.

(Letter) July 12. 4½ A.M. All day yesterday it was as hot as ever but last night the big clouds began to roll down from the North and we had a cooling thunder shower which was a most welcome boon to everybody. The flies made a fierce attack on me this morning very early, so to disappoint them I have gotten up, taken a bath, and am going to answer your letter of the 8th. . . . News came last night that our troops were defeated in Maryland and that General Tyler was captured. The whole of the 6th Corps have gone up there, and, I believe, the 19th Corps also. There must be a good deal of excitement in Washington and Baltimore now. I wish I was up there with you. Our headquarters are going to move camp at 8 o'clock this morning; we are going about three miles nearer City Point, as our lines have been somewhat shortened by the withdrawal of the 6th Corps. The usual amount of skirmishing and cannonading continues; we have about one hundred men a day killed and wounded by it. The Rebels have repaired nearly all the railroads that were cut and trains of cars pass every night through Petersburg towards Richmond. Part of the town has been burned by our shells, the gas works among the rest. . . . I hope that this Maryland raid is not going to amount to anything very serious, for if the Rebels should by any chance get into Washington I don't think they would show much mercy. I should want you to be in Philadelphia or up in New York with Robert Stevens about that time. I have not been on horseback yet and fear that it will be some time before I shall—my leg is a perfect nuisance to me.

(Note-book) July 13. Hot and sultry. Ice-houses have given out. The 2nd Corps have swung backwards on the left and are massed behind the 5th Corps. News in the Washington *Chronicle* of July 11th, is that the Rebels have been skirmishing in the vicinity of Tenallytown, that Gunpowder Bridge is burned, Governor Bradford's house burned, and the devil to pay in general. Wrote letter to Kate and lay still all day.

(Letter) July 13. Headquarters are now in a pine forest on a broad-backed hill in rear of the 9th Corps; 200 yards

away through the trees, we can see the white tents of the 9th Corps Hospital and just in front of us is a heavy mortar battery and another of four and a half inch rifled guns. All night long they were booming away at five minute intervals and all day to-day we have been serenaded by the sharp reports of the sharpshooters' rifles. Siege operations are fairly under way against Petersburg and we are working away patiently. Dr. Porter says that you are looking very well and that Birdie is the most philosophical baby he ever saw in his life. The news he brings from the Rebel invasion into Maryland is bad but I hope for something more cheerful to-night in the mail. The mail has come but the cheerful information has not—instead there comes news of skirmishing near Tenallytown, the destruction of a bridge on the Baltimore and Philadelphia R. R., and the mischief to pay in general. It is perfectly ridiculous, as the man said when the Indians burned his house, killed his wife and scalped his children. I do not fear for the safety of Washington, for I know that the 6th Corps is there and I do not believe that the Rebel force numbers over 20,000, but I fear you will be alarmed, worried, and anxious, and moreover that this raid will do much towards discouraging people. Let the people once get disheartened and we are all up a spout. Well, Well! God will arrange all things for the best I know. Nothing new has happened here but I should not wonder if we made an assault on Petersburg in a day or two. I hope we shall capture it if we do, and we ought to I think.

(Note-book) July 14. Opens sunny, but windy and very pleasant. Order issued to level all of the enemy's old works that are within our lines. Received letter from Kate. Beautiful moonlight night.

(Letter) Your letter with the postage stamps came to-night and with it the *Chronicle* giving an account of skirmishing on the 7th Street road. I can't bring myself to believe however that the Rebs will make any serious attack on Washington—and I think their force is overestimated. Still the

possibility of serious trouble up there is an ever recurring idea to me, and an extremely unpleasant one too, when I think of the difficulties and perhaps privations that you and Birdie would be subject to. I shan't feel comfortable until I know that the Rebs are again across the Potomac. Nothing new has happened down here—we are still going on with the siege operations and the batteries may open at any moment. The 2nd Corps is massed in column behind the 5th, ready I suppose for a grand charge when the time comes. They have been busy to-day in levelling the forts and earthworks which we took from the Rebels when we first came here. It is a magnificent moonlight night, and the silver flood pours down through the tall pine trees making everything almost as light as day. Dr. McGill is in his tent just back of mine reading some dreadful novel or other—Dr. Ghiselin is sitting out in the moonlight and Dr. Porter has not yet returned from his ride. I have been making maps all day to-day.

(Letter) July 15. Not very much that is new to-day, Kitten—the great event being the erection of a very tall flag staff in front of General Meade's tent, which looks as if he intended to remain here for some time. Rumours are afloat about camp that the Rebels are leaving Maryland and returning across the Potomac. I hope it is true and that Genl. Hunter will make his mark on them. The mail perhaps will bring something certain. About 75 men are killed and wounded per day along the lines mostly by shells and sharpshooters. The siege operations are going on slowly but certainly. It will be grand, gloomy and peculiar when our batteries do open and I am specially anxious to see it. They are digging a large mine under one of the Reb batteries in which 3 tons of powder are to be exploded, which it is hoped will blow the whole thing to the other side of Jordan; if the miners don't get blown up by a counter-mine before they get done—that will also be a pleasing spectacle. No rain has fallen yet and I cannot give you the remotest conception of the dust plague which overshadows us all. The flies too—bless them! get more playful and insinuating every day. But we have our tent strewn with green

pine boughs, keep a leather bucket of ice water always on hand—and smoke incessantly—so that we are tolerably comfortable—much more so, I am sure, than I was last summer. The mail is in, but brings no news except that the Rebs have run away. So I can go to sleep quietly without anxiety lest you should be in trouble. My health is tolerably good—I do not suffer any pain but I do not ride any as yet, for my leg is still too numb to make me feel secure when on a horse.

(Note-book) July 15. Rode out for the first time for a long while this morning. Went to 1st Division Hospital, 5th Corps, then up to the works by Dunn's house in front of the 9th Corps Hospitals.

July 16. Nothing new. Drs. Dougherty and Milhau were up to-day to consult with Dr. McParlin relative to an order of Genl. Meade's of the 15th inst. substituting musicians for all the Hospital Attendants at City Point.[1] Milhau was peculiarly jolly and brought up the subject of Pelican Gout with special glee.

July 17. Sunday. A very cold night last night—and a very hot day to-day. Burnside's mine is to be finished to-day.

July 18. Damp and foggy. Bedding, books, and everything in the tent damp and slimy. A Rebel attack was expected early this morning, horses were ordered to be saddled etc.—but nothing came of it. Letter from Kate in the evening. Discussed Cytology with Porter who in the midst of a slashing diatribe on things in general got some tobacco juice in his left eye, which entirely altered his views for the time being.

July 19. Raining steadily and monotonously since 4 A.M. Absolute quiet reigns along the lines. Wrote a letter to Kate—

[1] Enlisted men from the line had been detailed as hospital attendants, those showing aptitude were retained for long periods. The order substituting musicians, untrained in hospital duty, threatened to demoralize hospital organization.

assisted in the examination of a candidate for the post of hospital steward and read the July number of Hays's *Journal.* 9 P.M. It has been raining gently but steadily all day—and the sky is still covered with dense clouds. In Hays's *Journal* I notice an extract from the *Gaz. Méd. de Paris* of Jan. 16th stating that M. Roussin has proved—to his own satisfaction at least—that substances chemically isomorphous are likewise so physiologically—that hens may lay eggs containing a very large proportion of iodides or bromides instead of chlorides.

(Letter) July 19. It began to rain before daylight this morning and has continued ever since, the monotonous drip, drip, drip on the tent continues steadily, and to me the sound although mournful is not unpleasant. It reminds me of the time when I used to lie in my tent at Fort Schuyler and listen to the same sound. I do not suppose that we shall see the sun again for a week, for it will have to rain steadily for that period at least to make up for lost time. . . . There is nothing new here, an assault on Petersburg may be made at any moment. Burnside has finished his mine, but it is not improbable that the Rebs have countermined him and it is very uncertain as to who will get blown up first. . . . After we take Petersburg, if I do not feel better, I shall get a sick leave of ten or fifteen days and come up to see you, and have electricity applied up and down and round about. . . . I suppose that the troops sent from this Army to Washington will return now that the famous siege is over and it may be that no attack will be made here until they get back. You don't seem to have been very much alarmed by the siege of Washington—although the newspapers made a great fuss about it. I am hoping every day to hear that Sherman has captured or routed Johnston—I am inclined to think something decisive will occur there before it does here.

(Note-book) July 20. Damp, cloudy, and warm. Rain falling at intervals. Moderately rapid artillery firing going on in front. Col. Burton[1] and Major Michler[2] state that the

[1] Henry S. Burton, artillery officer, 1839–69.

[2] Nathaniel Michler, engineer officer.

Rebs are constantly opening new batteries and changing their positions—that our lines cannot be advanced any further, and that Burnside's mine explosion is indefinitely postponed because there is nothing there now to blow up. "Baldy" Smith[1] has been relieved from command of the 18th Corps. To-day's mail brought a letter from Kate—also the news of the President's call for 500,000 men. All of which is very cheerful and jolly.

July 21. Nothing new. Sunny day. Wrote to Kate.

(Letter) July 21. Nothing new has happened since I last wrote, in this vicinity at least. Some very significant events have happened elsewhere however as I see by the papers. 1st. The President's call for 500,000 men. 2nd. The publication of the platform of the Peace Party. 3rd. The proposed issue of two hundred millions of dollars of non-legal-tender notes by Mr. Fessenden. 4th. The siege of Atlanta by Genl. Sherman. 5th. The motion of lack of confidence in Government made in the English Parliament. The rain has ceased and the sun is shining as bright as ever this morning—although the heavy clouds around the horizon show that more rain is to come. The artillery skirmishing yesterday and last night was sharp and continuous. The Rebs opened three new batteries which had previously been concealed by woods—and then we executed corresponding manœuvres. I am daily expecting that we shall abandon the siege of Petersburg, cross the Appomattox to Bermuda Hundred, then cross the James River above Malvern Hill and move up towards Richmond on the Charles City, Newmarket and Central roads. If you will look at your map you will see where that would bring us to. . . . As to being alarmed about my health you can stop that immediately. My left leg is partially paralyzed—from the hip downwards so that I cannot get on a horse nor walk with any rapidity. It is the same trouble that I had last summer. But I do not have any

[1] Major-General William F. Smith, United States Volunteers, Major of Engineers. "Baldy" was a nickname borne from his cadet days at West Point.

pain now and my general health is good. I suppose I could get a sick leave now of 20 days if I asked for it, but I do not want it because I want to serve out my full time now that I have commenced, so that when I do get out I can stay out and be quiet. If I find myself getting any worse I shall come home immediately. It will take some time for me to get well—but I do not think there is anything dangerous in it. It is probably what doctors call reflex paralysis—very disagreeable but not at all dangerous. . . . I can never have a more comfortable situation while away from you and home comforts than that which I have now—I am interested in my work and I want to complete the history of the campaign before I leave.

(Note-book) July 22. Received a letter from Kate, also two numbers of the *London Lancet* and *Silliman's Journal* for July. McParlin went to City Point to-day. I have been preparing a series of surgical questions all day.

July 23. Have felt very ill all day—feverish, restless, with headache and nausea. Went to 9th Corps Hospital to see Sergt. Meade who has been wounded in the left breast. No fighting. News came to-day of the peace negotiations at Niagara Falls.

July 24. Sunday. Raining this evening—very gloomy.

(Letter) July 24. The Rebellion is still standing on its last legs at Petersburg. The Army of the Potomac is still lying in front of it. When the Rebellion gets tired of standing it will probably lie down too. Having thus given you a comprehensive view of the situation I turn to other subjects of more interest. After having seriously reflected for ten minutes since I wrote that last sentence I must say that I don't know any subject of interest. General Sherman seems to have been having a good time in the vicinity of Atlanta. A bookseller's stand is open within 100 yards so that the supply of novels, magazines, etc., is unlimited. My health is *in statu quo*. There has been a great deal of weather about here lately. And I can't write a letter to you now to save my life, so I won't try.

7 P.M. Yours of the 21st has just come—do not be worried in any way—if I am not better in a week I will come.

On July 26, 1864, Dr. Billings was granted twenty days' sick leave by Service Order 199, proceeding to Washington, where, on August 12th, he was granted permission to remain for medical treatment. On August 22d, by S. O. 277, A. G. O., he was relieved from duty in the field, and ordered to report to the Medical Director, Army of the Potomac, for duty in his office in Washington, where he remained until December 27th, when he was transferred to the Surgeon-General's Office.

During October, he seems to have paid a short visit to his old headquarters before Petersburg, as his note-books show:

(Letter) October 27. I reached headquarters about 10 P.M. last night after many disagreeables, not the least of which was being compelled to ride ten miles on an open car loaded with ammunition and with a drunken engineer. I got here just in time as the army has cut loose from City Point, and is now engaged in a fight on the Southside R. Road—which fight will probably get hotter as the day goes on. I found every one well and glad to see me, and am now on the top of a pine stump on a high hill which commands a view of our line for two miles each way. Ambulances are going past with the wounded, and a grand assault has been ordered, which I am waiting to see.

(Note-book) October 27. Came up last night on an ammunition train with a drunken engineer—met McGill at Warren Station. Headquarters at Poplar Grove Ch. Moved this morning at 4 A.M., an assault having been ordered at daylight, to Fort Clemens. Genl. Grant and staff came up in the morning. Day cool and cloudy. The hospital wagons of the 5th Corps came up, which is supposed to be contrary to orders. It was very fortunate however, as it began to rain about 5 P.M. and continued until midnight. The 5th Corps had about

100 wounded. The 2nd Corps had but 41 ambulances and no Hospital. Had about 400 wounded. All the ambulances were loaded with wounded and started for Warren Station about 7 P.M. The Corps withdraws about 1 A.M. (28th) leaving over 100 wounded behind with three doctors. An order was issued to send wounded to Warren Station to meet a train which would be ready by 8 A.M. the 28th. Headquarters during the night were near the Armstrong House.

(Letter) October 28. The fighting is over for the present and the Army has returned to its former position. Headquarters are on the Railroad about 8 miles from City Point. We lost about 1000 in all—the Rebs about 1600. No results. Another move will probably take place next week. I am well and jolly and glad I came. I shall write a long letter to-morrow when the wagons come up and an office is established.

(Note-book) October 28. A fine bright sunny morning, windy. Orders to move at 6 A.M. and the wagons were packed and sent off at that time. Returned in the evening to the Aiken house—the movement having been abandoned.

Here Billings's note-books and wartime letters end; on December 27, 1864, he reported for duty in the Surgeon-General's Office at Washington, per S. O. 476, A. G. O., December 31, 1864 and remained there until August 20, 1895.

Sometime during the year, Dr. Billings rendered to the Medical Director (Surgeon McParlin) an interesting "Report on the Treatment of Diseases and Injuries in the Army of the Potomac during 1864."[1] This begins with a detailed account of the methods of hospital organization and administration, as originally prescribed by Letterman, describes the mode of collecting, transporting, and caring for the wounded during an engagement, gives some in-

[1] *Medical and Surgical History of the War*, Washington, 1870, pt. i., vol. i., 199–202.

teresting observations on sunstroke, scurvy, and typho-malarial fever during the campaign and concludes with a thoroughgoing critique of the surgery performed in the field hospitals, which he pronounces "unprecedently good." Many years afterward (in 1905), Dr. Billings summed up the substance of this criticism as follows:

Looking back at the war as I remember it, it is a wonder that so many of the medical officers did as well as they did, and that the results were as good as they were. My main criticism of the surgical work that I saw was that too much resection was attempted in cases of injury of the long bones. If a ball smashed a femur, some surgeons wanted to get out all of the fragments, although in doing so they made the injury much more severe.

During the first two years of the war the records of the wounded in field hospitals were often very imperfect, for comparatively few surgeons made notes of their cases. During the last two years of the war the records were much more complete, as a medical officer and a hospital steward were often detailed for the duty of making such records.[1]

In McParlin's "Report of the Medical Director of the Army of the Potomac, from January 14 to July 31, 1864," which was largely prepared from the pocket-book notes made by Billings in the field and written out by him during the siege of Petersburg, there is a description of the battle of the Wilderness, which is worth quoting:

As has been well said, "this was a battle which no man saw or could see," fought in the midst of dense thickets of second growth underbrush and evergreens, rendering the use of artillery almost impossible, and compelling the opposing lines to approach very near in order to see each other. It was a series of fierce attacks and repulses on either side, and the hostile lines swayed back and forth over a strip of ground two

[1] *Tr. Coll. Phys.*, Phila., 1905, 3 s., xxvii., 121.

hundred yards to a mile in width, in which the severely wounded of both sides were scattered. This strip of woods was on fire in many places, and some of the wounded who were unable to escape were thus either suffocated or burned to death. The number who thus perished is unknown, but it is supposed to have been about two hundred. The stretcher-bearers of the ambulance corps followed the line of battle closely, and displayed great gallantry in their efforts to bring off the wounded lying between the lines, but with very little success, it being almost impossible to find wounded men lying scattered through the dense thickets, and the enemy firing at every moving light or even at the slightest noise. . . . The proportion of officers wounded was very large, being one to every sixteen enlisted men. This was due to the fact that the conflict partook of the character of skirmishing on a large scale, and those who were the most conspicuously dressed were the first victims. For a similar reason the Zouave Brigade of the 1st Division, Fifth Corps, whose uniforms were braided with red and yellow scrolls met with a very heavy loss. . . . As an interesting fact bearing upon the character of the conflict, it may be mentioned that it is stated by the chief ordnance officer that but eleven rounds of ammunition per man were used by the Army during the three days' fight.[1]

Contrast the accuracy of this plain narrative, based on the jottings in pocket note-books, with the more embellished account of the later historians (Nicolay and Hay):

In this manner began the mutual slaughter of the Wilderness, on a scene the strangest ever chosen by man or by destiny for the field of a great battle. The primeval forest had been cut away in former years to serve the needs of mines and furnaces in the neighbourhood; those industries had declined and perished; and now the whole region, left to itself, had been covered with a wild and shaggy growth of scrub oak, dwarf pines, and hazel thicket woven together by trailing vines and

[1] *Med. and Surg. History of the War*, Washington, 1870, pt. i., vol. i., 151–152.

briers. Into this dense jungle the troops of Warren plunged, and were instantly lost to sight of their commanders and of each other. They fought under terrible disadvantages; deprived of the view of their comrades to the left and right, not knowing what obstacles or dangers would confront them at every step, they made through the dismal chaparral.

On the other hand, the Confederates, being in position, had every advantage of this strange situation. Unseen and silent, they could await the approach of the Federal troops, whose every movement was betrayed by the noise of their march, and could thus deliver the first and most murderous volley. . . . Neither party on account of the nature of the country, could follow up these momentary successes. On each side the soldiers hastily intrenched themselves in every position they assumed. There could be no ensemble in such a fight. A series of detached and sanguinary skirmishes took place all day.

Scattered through the three surgical volumes of the *Medical and Surgical History of the War of the Rebellion* are many reports of surgical cases which show that Billings was one of the ablest American operators of his time. Most of his own surgical work was performed at Cliffburne (1862), at Chancellorsville and Gettysburg (1863), but during the campaign of 1864, he was constantly in request as an adviser or consultant in difficult cases. His actual work included all the major amputations and excisions, trephining and operations for gunshot wounds of the head and pelvis, in fact about all that was usually done in the pre-antiseptic period. He was the first surgeon in the war to attempt the unusual operation of excision of the ankle joint (January 6, 1862) which had been done only two or three times before in the history of surgery, and was successful in his case. Lister's classical paper on excision of the wrist, which set the pace in these procedures, was not published until 1865.

Several photographs of Dr. Billings, taken during this war period, exist and are undoubtedly good likenesses. The earliest represents a fine, serious young face, with a certain glint in the eyes which suggests that, like other earnest spirits of the time, he had his full share of worries and responsibilities and felt them. General Woodhull, in a private letter to the writer says: "I remember seeing a pale, quiet, silent young man, brought [as a guest] to the Union Hotel [Hospital] one evening in September [1861] while I was on duty there." In the Army Medical Library, there hangs one of Brady's photographs of a group of officers in which Billings appears, a tall, spare figure, with a worn serious face, corresponding with this description. A large photograph, evidently of a later period, which hangs in the same Library, represents a stalwart, full-bearded man, with a shrewd, penetrating gaze, the look of one who has long since learned to meet the world on its own terms, has taken its buffets and rewards with equal thanks, and is no pipe for fortune's finger to play upon.

Dr. Weir Mitchell, in a few exquisite lines, has left us an enduring impression of the young army surgeon of these early portraits:

> To comprehend the character of a man, he must have been seen in his relation to the various duties which test the qualities of both heart and head. The charge of suffering, crippled, wounded soldiers is a trial to the surgeon, and here he showed the man at his best. He was patient with the impatient, never irritable with the unreason of sufferers, never seeming to be in a hurry, and left at every bedside in the long sad wards the impression of being in earnest and honestly interested.
>
> It was thus I first knew John Billings when in the crowded wards wearied homesick men welcomed his kindly face and the almost womanly tenderness he brought to a difficult service.
>
> My own personal relations with John Billings began in the

Civil War when he had for a time the care of my brother, a medical cadet, during a mortal illness contracted in the Douglas Hospital, Washington. I saw then how gentle-minded was this man and how he realized the pathetic disappointment of a highly gifted young life consciously drifting deathward. I saw thus a side of John Billings he rarely revealed in its fullness.[1]

In the *Harvard Memorial Biographies*,[2] we read, in the sketch of the life of Lieutenant Edward Stanley Abbot of Boston, who was mortally wounded at Gettysburg:

On Tuesday morning, when the surgeon, Dr. Billings, of the Regular service, came in, Stanley asked the Doctor to feel his pulse, and desired to know if he was feverish, since the pulsations were at one time strong and quick and then slow and feeble. Dr. Billings, a most excellent surgeon and a very prompt and straightforward man, felt of the pulse, and then, looking Stanley in the eye, slowly answered, "No, Mr. Abbot, there is no fever there. You are bleeding internally. You never will see to-morrow's sunset." Captain Walcott, the officer at his side who related these circumstances to me, says that he then looked at Stanley, to see the effect of these words. But Stanley was entirely calm. Presently he said, with a smile, "That is rather hard, isn't it? but it's all right; and I thought as much ever since I was hit." Dr. Billings asked him if he had any messages to leave for his friends. Stanley said he would tell Walcott everything; saying, too, that I should come on there, and that everything was to be given to me. Dr. Billings then left him.

The same impression is conveyed in a private letter of Edwin H. Abbot, author of the above, which the writer is privileged to quote,[3] relating to a visit to Gettysburg in search of his brother, Lieutenant Abbot, 17th Infantry:

[1] Weir Mitchell, *Science*, N. Y., 1913, n. s., xxxviii., 831.

[2] *Harvard Memorial Biographies*, Cambridge, 1867, ii., 407.

[3] By kind permission of General Henry L. Abbot, of Cambridge, Mass.

At last we reached the Fifth Corps Hospital. Dr. Billings had charge of the camp with Dr. Ramsey, both admirable surgeons. I knew that if all Stanley could telegraph was "Dr. says not mortal," the wound must be as near mortal as it could be without being so. I asked, "Can I see Lieutenant Abbot, 17th Infantry?" "Lieutenant Abbot," said Dr. Billings, looking me kindly in the face, "died on Wednesday at noon. We got your telegram and have saved his things for you. I had the body carefully wrapped in his blanket and the grave marked for you. He left all directions with Lieutenant Walcott of his regiment who lay by his side until he died. I will lead you to him." It was to this extra-official kindness, [General Abbot goes on to say], under circumstances of confusion rarely equalled, that my brother Edwin was able to recover the body for transportation.

One of Billings's old army friends once said that never, in all the course of a long and intimate association, did he reveal his reasons for going into the war or discuss its issues after the struggle was over. Having done his duty it became to him a closed incident. He permitted no discussion of it in his house, and one enterprising spirit who attempted it was promptly silenced, under pain of being shown the door. To many Southern men he became warmly attached, in particular to Hunter McGuire, Stonewall Jackson's old army surgeon, with whom he and his colleague Fletcher exchanged many a merry jest. At Memphis, after the yellow fever epidemic of 1879, he carried everything before him. Billings gave up a promising surgical career to enter the Army, and, as with most Western men, his probable motive was not concerned with any special interest in abolition or States' rights, but was based upon a simple feeling of loyalty to the Union. He lived to learn in battle that the ardent, hot-tempered Southerner as well as the cool Northerner or the rugged, aggressive Westerner, took up arms from the same passion which

impelled the Scotch Highlander to kiss his mother earth, and such was, no doubt, his own feeling:

> Being here, my mind
> Is yet to serve no mistress but alone
> This earth my bones were bred of, this kind land
> Which moulded me and fostered; her strong milk
> Put manhood in my blood, and from my heart
> If she that nurtured need it now to drink
> I think not much to shed it.[1]

To the last, Billings retained a latent regard for the memory of his comrades in arms who were killed in battle. At the close of his reminiscences of Tom Allen, the schoolmate friend of his youth, written at the most crowded period of his busy life, he sets aside a sprig of rosemary in remembrance of this "tan-faced prairie boy" of the West, who probably had a nameless grave and whom everyone else had forgotten:

The last time I saw Tom he was cooking, but in a place and under circumstances widely different from those I have described. It was by a little camp-fire on the roadside, near Todd's Tavern in Virginia, on the morning of the eighth of May, 1864.

The regiment in which he was a private was making a short halt after having marched nearly all night, and the men were making coffee in their tin cups.

Tom was broiling a piece of salt pork over the fire; and although the slender figure had filled out, though the freckles were replaced by tan, and the blue uniform was very different from the college dress, otherwise there was little change; and there was something in the attitude as he leaned forward toward the fire with averted face, which at once reminded me of the times when I had seen him in the same position before his fireplace in "south-east."

[1] Speech of the Regent Murray in Swinburne's *Bothwell*, act v., sc. 3.

I had changed more than he, and had to introduce myself; but when he once knew who it was, his greetings, and his invitation to have some coffee and pork, were as cordial as in the old days.

Five minutes of hurried question and answer to get the latest news of old schoolmates, a mouthful of black coffee from the tin cup, with a wish for his health and success, and we parted.

An hour after that Tom's regiment was in the thick of the Spottsylvania fight, and at the next roll-call he was not there to answer.

CHAPTER III

OFFICIAL LIFE IN WASHINGTON

ON August 22, 1864, Dr. Billings was relieved from duty in the field, and assigned to the Washington branch of the Office of the Medical Director of the Army of the Potomac, in connection with the care, arrangement, and analysis of its field reports, the results of which were duly embodied in the *Medical and Surgical History of the War*. On December 27, 1864, he was transferred to the Surgeon-General's Office in the War Department, where he was to remain on continuous duty for the next thirty years, indeed, until his retirement, at his own request, from active service in the Army on October 1, 1895. Here his duties and responsibilities were to be of the most varied character, and the cheerful readiness with which he shouldered every burden, however onerous, as well as the spirit of unselfishness displayed in taking additional labours upon himself, and in furthering national enterprises of great moment, soon brought him prominently before the public eye as an administrator of unique ability. During the first ten years of his official life in Washington, his time was largely taken up with the dry, uninspiring routine of departmental business, what General Woodhull, who for two or three years of this time was intimately associated with him, defines as "arid drudgery among invoices and receipts, requisitions and bills of lading, treasury drafts and auditor's decisions." Officially, he was in

charge "of the organization of the Veteran Reserve Corps, of matters pertaining to contract physicians, and to all property and disbursing accounts," until 1875. His first duties were in connection with the great body of acting assistant surgeons, civil physicians whom the government employed for army duty under contract in the most varied ways, serving in the large military hospitals of the interior, on transports and floating hospitals, as reserves, or actually in the field, all under control of the Surgeon General. After the event of Appomattox, this vast body of acting assistant surgeons was gradually disbanded by the annulment of their contracts, reverting to civil life as the necessity for their services ceased.

The great hospitals were also discontinued, and Billings's work was in consequence extended from the financial management of these properties and their appropriations to the final settlement of their accounts, as well as those of the discharged volunteer surgeons, and "the clearance under the regulations of the Treasury of nearly all the non-continuing appropriations."

His days [General Woodhull goes on to say] were filled with routine office work, with questions of bookkeeping and pecuniary responsibility, with the supervision of clerks and balances, indispensable but not alluring to a mind interested in problems of military medicine. He accepted it soberly as belonging in the day's work. It was his disposition to do with his might what his hand found to do, and this had been intrusted to him. For the time contract surgeons and property accountability became his vocation, and he followed that vocation carefully. It showed that he had the natural qualities of a good superintendent and business man; it showed him to be discreet, firm, and to respect the responsibility involved in money intrusted to his official care, but not to mistake parsimony for economy. This practical work also profited him all his life.[1]

[1] Woodhull, *op. cit.*, pp. 331–332.

During these earlier years, Billings did not allow the tediums and doldrums of departmental life to sink his spirits. His private tastes were entirely inclined to the full enjoyment of his domestic happiness, all the more dearly bought by the long period of separation from his wife during the war; and among his fellows, the attractive band of bright and capable young officers whom Surgeon-General Barnes had gathered about him, he devoted himself to the ardent study of microscopy and micro-photography, as well as dissecting, and privately taught himself German by reading Virchow's work on tumors, then just published, in the original. Among his brother officers were such men as the handsome and witty Edward Curtis, the high-spirited and high-minded Alfred A. Woodhull, the learned and conscientious Joseph Janvier Woodward, one of the earliest experts in photomicrography, and George A. Otis, one of the leading editors of the *Medical and Surgical History of the War*. With these, he became so proficient in the technique of microscopy that had he pursued it as an end in itself, he would have become an authority on the subject in time. The principal results of his labours in this field were his studies on the minute fungi, which bore fruit in the report on cryptogamic growths in cattle diseases, made with Edward Curtis in 1869, and in his subsequent work in bacteriology in the Laboratory of Hygiene at the University of Pennsylvania. An interest in philosophy and theosophy, in Plato and Spinoza, in Cornelius Agrippa and Paracelsus, in the Smaragdine Table and the Cabbala, acquired through a chance friendship with General Ethan Allen Hitchcock, was to have a direct bearing upon his future lectures on the history of medicine, in which he was a pioneer in the United States. In far Eastern lore, he was probably more deeply versed than any other American physician of his time. Apart from definite studies, he read much and



CLIFFBURNE HOSPITAL, WASHINGTON, D. C.—1862

widely, his unusual gift of vision enabling him to absorb a vast amount of information with great rapidity.

During the first years after his active service in the field, he seems to have wisely determined to let his mind and spirit lie fallow and to have given himself up to the unalloyed enjoyment of the private domestic life to which his tastes inclined. Of his letters written during the year 1865, there remains but one, a letter which was never delivered and which has a pathetic interest in that it was sent to a fellow-graduate from the Medical College of Ohio, an old friend and one of his comrades in arms, Dr. Alexander Ingram, Assistant Surgeon, United States Army, who, as Billings said long after,[1] "went through the war safely, doing good service, and then, in 1865, went down in the wreck of the ill-fated steamer *Brother Jonathan* on the coast of California."[2]

July 3, 1865.

My Dear Old Fellow:

The world is still turning on its axis and coming various games of that sort, and I am going to gossip a little with you that you may know how we are progressing. The Army of the Potomac is at last broken up and Washington is filled with officers, who, like Othello, find their occupation gone. Surgeons U. S. V. are going out every day —I. I. Hayes, Gross, Lidell, T. R. Spencer, Thornton, Owens, Gilbert, McKibben, Hayden, Petherbridge, etc., etc., are out, and, by the time Congress meets most of them will be gone. Of our Corps, Okie, Homans and Adolphus have resigned. The Examining Board will meet in September, but I cannot tell whether you will be ordered in to appear before it or not; I think not till next spring. A dozen or more of our Corps are to be brevetted. Marsh and

[1] Ohio Medical College Address, *Cincinnati Lancet-Clinic*, 1888, n. s., xx., 303.

[2] July 30, 1865.

McGill are now brevet Majors. Who the others are I am not sure. Woodward, Spencer, McClellan, Woodhull, Lee, A. H. Smith, J. H. Brinton and McMillan are on the list I think. . . . Heat, dust and flies, I need hardly tell you, render life a burden and a curse in this vicinity. I am kept pretty busy just now, but in two months more I shall be about done and shall probably be sent somewhere else. The hospitals closed here are: Seminary, Ricord, Columbia College, Mount Pleasant, Judiciary Square, Finley, Campbell and Fairfax Seminary. Washington is full of Southerners who want to be pardoned or to run some political machine, but from the newspapers I presume you will be fully informed of all that has been done before this can reach you. The prospects of our Corps are, I think, good; while Barnes is at the head of affairs, we shall not be over-ridden without a severe struggle. Financially, things are getting worse if anything—it takes close calculating to make my salary meet expenses. I suppose it is worse in California however. . . . There have been few or no changes of station or assignments to duty since I last wrote. The S. G., I presume, is waiting for things to crystallize a little before he makes any arrangements and, in the meantime, we Subs are instructed to do just enough to meet emergencies and no more. From Cincinnati the only thing I have is a letter from Sister Anthony in which she says she has given up her new hospital for the present, that everything goes on in the same old way, quarrels included. Next fall I am going to try to go on there for a week or so. You, I hope, are enjoying life as it comes along and by the aid of dark-eyed señoritas are becoming a proficient in Spanish. Just now you are having a quiet resting sort of time; by and by, as the wheel turns round, you will be plunged into the foam and eddies of the stream of life again. You ought to be getting on your muscle again by this time; when I next shake your hand, I hope you will be several pounds heavier and several shades ruddier than you were when I bade you good-bye. I hope too that you have some chance of getting into private practice and of heaping up some of the filthy lucre. That last however is a useless wish, for you could not heap up if you were getting $1,000 a month:

if you could not dispose of it yourself, it would go for your friends' benefit. Be careful to tell me all about it when you next write. In scientific or medical literature, there has been absolutely nothing new since you left. I don't pretend to read anything but novels and have not found any of them that were fit to read. My principal labour outside of office hours for the past month has been applied to colouring a new meerschaum and with very good success. I have really enjoyed life this spring and feel very jolly over future prospects. Kate and I have everything arranged to suit us, and we have discovered the art of getting much pleasure out of scanty materials. I very seldom visit or go out anywhere; I never find any place where everything so exactly suits me as it does in my two rooms at home. I suppose that I have deteriorated somewhat, that I have become lazy, etc. I have certainly abandoned all my ambitious plans and am only desirous of keeping Kate and Birdie with me and of enjoying myself in my own peculiar way. A stagnant sort of way it no doubt seems to you—you who crave for excitement and something new—but it is rather pleasant after all. I have been expecting a letter from you for a week or so and hope that it will come in before long. Take good care of yourself—forswear sack—beware of the señoritas—be virtuous generally—and don't forget old friends.

As of old,

Yours affectionately,

JOHN.

At the beginning of the year 1866, Dr. Billings and his wife agreed, each of them, to keep a private journal of their experiences through the year. Dr. Billings's diary is kept up bravely until the autumn, when there are a number of significant gaps, the whole matter terminating abruptly with a downright expression of his then state of mind: "Keeping a journal is a d—d humbug." The excerpts given illustrate his daily life, his growing interest in microscopy and theosophy, and his dry, humorous, statistical way of taking things as they come.

Monday, January 1, 1866. Dressed in gorgeous array and called upon the President and Secretary Stanton with the Surgeon-General; then to the Surgeon-General's house. Had eggnog, eatables and cards. The day passed off pleasantly; mud, slush and drizzle out-of-doors but quiet jollity inside. This is going to be a memorable year I think, and I mean to take notes as the days go by. We have made a fair beginning; everybody has kept the peace except myself during the day and my fracture of it was not serious.

January 2. Worked at leisure moments at a descriptive catalogue of the skulls of the Museum, which I am preparing for Dr. Woodhull.

January 3. Enjoyed the evening (at P.'s) by examining Doré's illustrations of the Bible, Dante, etc. Mr. P. made an ass of himself by several assertions, *e.g.*, that he is an intimate friend of Doré's.

January 7. To the office where I spent the forenoon describing fractured skulls by a big fire, smoking a pipe and with no one to molest or make me afraid.

January 10. After dinner, smoked and talked or rather listened to J. J. Woodward, who discoursed of cytosis very well and learnedly. He quoted a saying of Bernard's—that "Fact is the root, Theory the flower and Law the fruit." Also the phrase of Rokitansky: "Upon this substratum of fact let us now proceed to rear a superstructure of well-considered hypothesis."

January 22. To the Navy Yard and visited the double turetted monitor *Miantonomoh*, going all over it. The machinery for ventilation and for working the turrets was especially admirable.

January 30. Found my thesis on epilepsy and was demoralized thereby, for I found that I knew much more four years ago than I do now, that is of minutiæ. I have gained in

breadth and connection of ideas but I have forgotten numbers and figures most wofully.

February 2. A beautiful morning like spring. If this weather continues long, we may expect the cholera, which is now in the West Indies. Got a four months' fœtus from Dr. Gesner; Kennon spoiled it in injecting but I think I can get some information out of it. Went to the Soldiers' Home with Dr. Laub to see a case of necrosis of the femur following amputation.

February 3. Was called down by Dr. Crane to consult in General Tyler's case.

February 4. Still sunny. . . . I ought to be studying now, for there is every prospect that the new surgeoncies will be filled by competitive examination.

February 6. Still sunny and pleasant. Congress are still on the negro subject. Dr. Lidell came in and showed me some beautiful pictures of osteomyelitis. . . . Find that real studying is hard work now—I don't remember things very well.

February 9. Am puzzled by the fact—if it is a fact—that a decapitated frog will choose means to remove irritation.

February 12. Office closed at 11 A.M. on account of Bancroft's eulogy of President Lincoln. Went up to 180 and, assisted by Curtis, murdered a big cat and injected it. Bought Flint's *Physiology* and read it nearly through.

February 14. Excitement has risen about the Army Bill again which now makes two-thirds of the surgeons from volunteers. Went home early and injected my kitten by Beale's process which, I very much fear, is a humbug, judging by the results I obtained. Read through *A Noble Life*, by Miss Muloch—very simple, very artistic, very good.

February 17. Clear and cold. Got up early and went out and secured the dog, greatly to Kate's disgust. Looked over Flint's *Practice of Medicine* which does not amount to much.

February 18. Worked hard all day injecting the viscera of the dog and preparing specimens of microscopical sections of spinal cord, etc. Was very successful and felt very jolly. Poor Kate has the most disagreeable part of the work, the removal of the debris, and I can easily fancy her joy when such a job is fairly over.

February 22. No office. Grand mass meeting to support President Johnson who must have had a drink before he made his speech in reply. Worked up at 180 all day and got out some beautiful specimens of lung, showing the epithelium of the air cells *in situ*.

February 23. Stayed at home and kept quiet, taking the opportunity to do some microscopic work, and at last triumphing in having mastered the first two steps of Beale's process. I have a beautiful injection of a dog's kidney and am at last sure of what I can do in that line.

February 24. Some sections of spinal cord of dog which I mounted yesterday in the *siccative d'Harlem* are very beautiful. But my greatest triumph is a specimen of sympathetic nerve plexus from the mesentery, which is magnificent.

February 25. Curtis came up in the evening and we experimented on the effect of placing variously-shaped diaphragms behind the back lens, with excellent results. Read a part of Mrs. Gaskell's last novel *Wives and Daughters*, which is good. A reference to a Moral Kangaroo was very excellent.

February 27. Clear and very pleasant. . . . Schafhirt came up and was enthusiastic over some points in comparative anatomy—the extraordinary development of the Meibomian glands in some birds and the position of the catfish, as shown by the pelvis, being his main points. He wants me to take up the subject and publish his discoveries. Went home and found a gold fish, which I injected instanter, using the Turnbull's blue fluid but, I fear, not very successfully. Schafhirt gave me an embryo kitten which I put in alcohol and soda.

February 28. Still pleasant. . . . My fish injection is, I fear, a failure, and, what is worse, I neglected to secure the skeleton, which I might have done. . . . Had to own up to a very bad mistake about the mesenteric nerve plexus of a kitten, which turns out to be capillaries.

March 1. Cloudy, misty, moisty. Worked a little at my fish's head before breakfast. Ordered a new suit of clothes with many misgivings.

March 2. Cat has carried my fish head off.

March 3. The concurrent resolution excluding the rebellious States has at last passed Congress and it is to be hoped that some of the real practical business will be taken up. The Habeas Corpus is suspended in Ireland, so there seems to have been something in Fenianism after all. Spring weather is fairly setting in and dust is already beginning to fly. A signal failure: the Atlantic cable.

March 4. (Sunday) Went up to the office for the walk's sake, then down to the Museum to see Woodhull, who has conceived the idea of my going across the plains with Colonel Porter of Grant's staff. . . . The 1/50th has come and I must see it to-morrow. I foresee trouble between J. J. and myself. What comes after cheese? Mice.

March 5. The March winds are out in their glory this morning. Woodhull and myself had a dispute on the proper classification of Museum specimens which, on appeal, was decided in my favour. Went to No. 180 and saw the 1/50th work. Good. Dined with Curtis and then went with Woodhull to Mr. George Gibbs to a meeting of the Potomac Natural History Society. Had a very pleasant evening. Coues seems to be the Society in himself. The difference between the fauna of the Pacific and Atlantic coast was noted. Drank a large quantity of rum punch and enjoyed myself hugely. . . . At 12 P.M. went to the office, got a mouse, and strolled home through the moonlight.

March 6. Tried to inject my mouse before breakfast and failed utterly. Sunny and pleasant morning but the sequelæ of last night put me a little below par. . . . Mitchell's *Atlas* came to-day—a dreadful swindle. Otis offered to get a dissecting microscope for me—something must be in the wind.

March 7. Cloudy and cool. Got books from binder, paid for suit of clothes and lent Porter $3.00. . . . Have been trying for a week to get some mice without success. . . . In Congress, the Senate are still on the negro; the House are doing a little white men's business.

March 8. Sun shining, but the March winds are out in their glory and by the time I reached the office, mouth and eyes were filled with dust. . . . Worked a little at the microscope in the evening and was very much pleased with the effect of some sections of kidney boiled in glycerine, soaked in ether and mounted in balsam.

March 9. Worked about four minutes with the microscope and found that carmine staining depends upon the ammonia free.

March 10. Clear and cold. Sent microscope to Zentmeyer to be fixed. Suggested a cholera manifesto to Dr. Crane, with ozone tests, etc. Got very enthusiastic all by myself over the Utopian idea of making the Surgeon-General head centre of the medical profession. Was sent up to see Major General Hitchcock, who had fallen down and scratched his face. By Crane's direction, went and talked with Woodward about the cholera manifesto and also about the form for recruiting blank.

March 11. Called on General Hitchcock. . . . He presented me with two of his works, being a mystical interpretation of Shakespeare's *Sonnets* and of Spenser's *Colin Clout's Come Home Again*. Worked all day at 180, injecting a kitten and the liver of a dog in two colours.

March 27. Had a batch of young mice given me.

March 28. The veto of the Civil Rights Bill is the prevailing sensation.

March 30. In the evening, went up to see General Hitchcock, taking Doré's illustrations to the *Wandering Jew* to amuse him. Went home and looked at the eclipse of the moon with due solemnity.

April 3. To-day, the President has proclaimed the Rebellion at an end everywhere save in Texas.

April 4. Got my orders and made ready to go to New York. Baird sent over Swammerdam on insects. . . . Started with Otis. Slept very well and was very jolly altogether.

April 6. Came on to Philadelphia, found Ramsey on Dick Street.

April 7. Went over to town and went to Zentmeyer's, Queen's, etc. . . . In the evening, went to a Mr. Jeffreys and saw the most magnificent collection of engravings and paintings that I ever met with—an illuminated missal of Queen Anne of Brittany, an original by Domenichino, a complete collection of Ary Scheffer and Kaulbach, madonnas of Raphael, Guido, and all the great masters crowded every corner.

April 11. Brought home an iguana which George gave me.

April 13. Read a little in Swammerdam and in the second volume of Owen on vertebrates, which came to-day.

April 15. With Greenleaf's help, I injected the iguana with tolerable success. Then worked for a long time cutting him up.

April 16. Read Paine's *Age of Reason* a little.

April 28. A beautiful day. . . . Read H. Spencer's *Principles of Biology* which correspond slightly with E. Levi's magic and went to sleep, reflecting on the cubic stone and upon Spencer's dictum that the scale of nature can only be represented in three dimensions.

April 30. The *Fortnightly Review* came in the morning, the best thing in it being an article by Lewes on Spinoza. Coleridge's formula to express the difference between Spinoza and Christianity is good: G − W = O : W − G = O, etc.

May 13. In the evening, read the Bible, Sir W. Hamilton, Spinoza and Eliphaz Levi, comparing each with the other.

May 15. For the last three days I have not touched the microscope, having put in the time reading Spinoza and medical journals. In the evening went over to Spencer's and played whist, being very successful and passing a very pleasant evening. Went home through the soft cool dusk, read a little in Sir W. Hamilton, and went to bed equilibrated.

May 17. Got a pile of curious books from the Congressional Library to-day: *Hermes*, *Cornelius Agrippa*, and the *Book of Enoch* and read hard in them all day.

May 18. Rainy and cold. General Hitchcock came in and brought Hermes, Gebir, Kaled, Flamel, Artephius, Roger Bacon and Ripley for me to read. Spent most of the day over them.

May 19. Sun shining again. . . . Spent the day hunting for the Philosopher's Stone. . . . Curtis came over and stayed all night. We read alchemy till twelve o'clock and broke down at last on the cabalistic iod.

May 26. Raining. . . . In the evening tried to read *Chandos*, a pestiferous book by Ouida, but could not do it.

May 28. Went around to Hampton's where I stayed all night. It was a magnificent moonlight evening and sitting up in the fifth story, I looked down on the city and tops of the trees and of course was sad.

May 30. Read Grose's Dictionary of the Vulgar Tongue and Espagnet on Alchymie. . . . News of General Scott's death came this morning. General Hitchcock was in to see me and

mentioned the speech of Scott's after the Mexican War, in which he attributed all his success to West Point graduates.

June 2. The Fenian invasion of Canada is the exciting topic at present.

July 10. Received a box of reptiles and creeping things from Texas, collected for me by Drs. Caldwell and Perry.

July 11. Dissected the nervous system of a tarantula.

July 28. Learned this morning to my great surprise and satisfaction, that Congress, after much strife, passed Wilson's Army Bill, slightly modified, at three o'clock A.M., the result of which is that I am now a Captain. . . . The cholera is slowly but steadily increasing in New York. McGill and Heger have been ordered there.

July 30. Greeted at the office this morning by the news of the success of the Atlantic cable. Everyone wants to know the provisions of the new Army Bill and nobody can find out with certainty. My being a Captain, however, is an undoubted fact. Crane was confirmed Assistant Surgeon-General upon which I solemnly congratulated him.

July 31. The cholera is increasing in Brooklyn and has appeared in Philadelphia.

August 2. Cholera still going on in New York and Philadelphia. . . . Good joke about McGill's sending in a bottle of rice-water discharge.

August 20. The President has proclaimed the war over in Texas.

September 22. In the evening, got down a German dictionary and attacked Virchow's book on tumors. Found it tough work but managed to get through one page.

September 26. Got through three pages of German at the office. . . . Had a good dinner, read three pages of German, mounted a Dante picture and felt better. Quizzed Woodhull on bones and joints and got into a metaphysico-theological talk with him, which lasted until ten P.M.

September 27. Dressed in full uniform, a new thing for me. Drew pay from Quartermaster's muster, which came just in time as I was reduced to 10 cents. Tried the sphygmograph on Abbott and Floyd-Jones.

September 29. Got through four pages of German.

September 30. (Sunday) Read Gilchrist's *Life of William Blake*, the Pictor Ignotus, a very remarkable man, something like Swedenborg, but without his logical balance. Read a little German; have got through twenty-five pages of Virchow in the past week.

October 5. Did not stir out of my office but read and studied all day long like a good boy; twelve pages of Virchow and Paget's article on tumors were waded through.

October 6. Read Virchow and the *Adventures of Tyl Owlglass*.

November 4. Woodhull and I tried our new chemical apparatus to-day.

In 1869, the Department of Agriculture published a volume of reports by the English veterinarian, Professor John Gamgee, and others, on diseases of cattle in the United States, the special forms of murrain considered being the splenic or Texas fever which had become epidemic in 1868, and pleuro-pneumonia. To this report was appended a special investigation, by Drs. Billings and Edward Curtis, of the Army, on the question of the possible cryptogamic

origin of these diseases. The theory that minute fungi may have to do with the causation of infectious diseases was then very popular, the pace having been set in one of the most famous monographs in the history of American medicine, that of Dr. John K. Mitchell on the cryptogamous origin of malarious and epidemic fevers (1849). But the concept was applied in a very vague and loose way, and at the time at which Billings and Curtis wrote, it was believed that these "cryptogamous diseases" were produced, not by the presence of a specific fungus in the blood, but by certain minute particles of protoplasm (micrococcus of Hallier), resulting from the development and breaking up of its spores or mycelium; and that the fungi in question could be developed from these micrococci in appropriate culture media, outside the body of the infected animal. The conclusions reached by Billings and Curtis are of a negative character. At the start, they recognize clearly that even if cryptogams were discoverable in the blood and secretions of diseased animals and their character and probable source ascertained, to prove an actual causal relation would be, in the then state of knowledge, a difficult matter, "a problem which we have not attempted to discuss." After a series of careful experiments, in which Hallier's culture methods are improved upon, they conclude that "in the contagious pleuro-pneumonia of cattle there is no peculiar fungus germ present in the blood or secretions, and that the theory of its cryptogamic origin is untenable." A similar conclusion is reached in regard to Texas fever. The authors cannot see how a deadly disease can be caused "by the presence, in the economy, of the germs of fungi notoriously harmless and of universal occurrence." They then proceed to another series of experiments leading to the proposition that "some of the bacteria and micrococcus germs are really fungoid in character and capable of

development into higher forms," a conclusion probably due to faulty manipulation and insufficient knowledge of methods of isolating micro-organisms. The authors wind up with a statement that, in establishing a causal relation, the lancet and injection tube will probably be more effective than the microscope and culture apparatus. This experimental research is of course null and void to-day, yet it shows the deep interest which Billings took in the germ theory of disease, more than ten years before the proper methods for investigating it had been discovered by the genius of Pasteur and Koch.

Billings made two other contributions to this branch of natural history. One of these is a short popular essay on "The Study of Minute Fungi," published in the *American Naturalist* (August, 1871),[1] the other is a close study of the "Genus Hysterium and Some of its Allies," published in the October number of the same journal[2] illustrated with a plate. In the first, he gives, in the absence of any text-book or treatise on the subject, some timely directions for budding microscopists who wish to take up the fungi, emphasizing the important point that merely to name a fungus or to find out what name somebody else has given it is nothing, unless the observer can prove that the alleged species is capable of producing and reproducing its kind. In the second memoir, as in a manuscript note-book which exists, one can trace the extent to which Billings pursued his own studies in this field. About this time he was to be drawn into public duties of more immediate importance, to himself, which rendered it impossible for him to go on further with this work. Mr. F. W. Stone, his secretary and assistant, relates that, sitting in his office one day in the early seventies, Billings called his messenger, and pointing to his microscopic slides and other paraphernalia said abruptly: "Here, take these things away: I'm done

[1] *Am. Naturalist*, Salem, Mass., 1871, v., 323–329. [2] *Ibid.*, 626–631.

with them." Long after, in 1902, he presented his valuable collection of fungi, many of them gathered by himself, to the New York Botanical Garden.[1]

In the year 1870, or thereabouts, his activities became extended in three important directions. About this time he was placed in charge of the collection of books known as the Library of the Surgeon-General's Office, which was the starting point of his work in medical bibliography. He was detailed, or borrowed by the Secretary of the Treasury, to inspect and report upon the condition of the Marine Hospital Service throughout the country, and, in 1870–75, he published the voluminous Reports on "Barracks and Hospitals" and "The Hygiene of the United States Army," which were his principal contributions to military medicine. These were the beginnings of his work in public hygiene, a subject in which he came in time to be recognized as a national authority.

In 1869–74, Dr. Billings was detailed, under the Secretary of the Treasury, to inspect and report upon the condition of the Marine Hospital Service throughout the country, in connection with which he prepared a plan for its reorganization, which was adopted. The Marine Hospital Service takes care of disabled sailors in ports along the seaboard and the inland waters of the United States and has charge of the Quarantine Service at all ports of entry. At that time, the Service was in a very bad way as to personnel and efficiency, many of its physicians being merely local practitioners, appointed for political reasons and holding their positions mainly as one means of gaining a livelihood. In some cases, this false economy was pushed to the extent of sub-letting the care of the sick and disabled seamen to local hospitals as an outside contract. Dr. Billings was selected for the investigation of these conditions on account of his already well-established reputa-

[1] *Science*, New York, March 28, 1902, p. 517.

tion as a capable and dependable man. He was attached to the service as a "consulting surgeon," and, in pursuance of his duties, he inspected the marine hospitals at all ports, from Baltimore to San Francisco and from Detroit to Key West. In the report of the Secretary of the Treasury for 1870, it is stated that "the condition of the marine hospitals has been improved during the past year. This result is largely due to Dr. J. S. Billings, of the Surgeon-General's Office, who has visited nearly all of them, and through whose advice many important changes have been made."[1] Dr. Billings was relieved from this detail in 1874. One merit of his work in this field was that he took the Marine Hospital Service out of politics and grafted upon it the Army methods of organization and discipline. As General Woodhull says, he "prepared a comprehensive and well-ordered plan for organization under a merit system and a scheme for proper and independent hospitals and their management, all with responsibility to competent central authority."[2] From this time on, this important part of the public service reached a high grade of efficiency, gradually expanding its scope to the scientific investigation, as well as the management, of infectious diseases. In 1912, it became the Public Health Service of the nation on its civil side. It has a well-organized Hygienic Laboratory, and its experts have done admirable work in many branches of scientific medicine.

In this period, Billings made two important contributions to military medicine, perhaps the best work he did in this field after his services in the Civil War. These were his reports to the Surgeon-General on "Barracks and Hospitals" (1870) and on "The Hygiene of the United States Army" (1875), which are still used in the service for historic and practical reference and are known as Circular No. 4,

[1] *Rept. Sec. Treasury*, Washington, 1870, p. xii.
[2] Woodhull, *op. cit.*, p. 333.

and Circular No. 8, respectively. Circular No. 4, a volume of 527 pages, consists of detailed descriptions, by various army medical officers, of the condition at that time of all the occupied stations of the United States Army, collated and edited by Billings, with a separate commentary of his own, which is the most important part of the work. In this period, we had, as he puts it, "the best fed and the worst housed army in the world," and these voluminous reports were published in aid of improving its status. In the first report, he notes that "it has been much more difficult to obtain facts than opinions; even when the former have been especially requested," which necessitated many corrections and additions in the separate reports. He gives an effective criticism of the deficiencies in bathing facilities, sleeping accommodations, latrines, the poor condition of the guard-houses and prisons, and discusses in thoroughgoing manner the ventilation and heating, for which he recommends a "ventilating double fire-place" of his own invention, consisting of two stoves placed back to back with an interspace for warming fresh air, as in the Galton fire-place. The most interesting part of Circular No. 4 is his sweeping criticism of the hospitals. This was the basis of his future work in hospital construction. He points out that, prior to the famous report made to the French Academy of Sciences by J. R. Tenon in 1788, there had been no true scientific hospital construction, so far as economy of administration and avoidance of contagion were concerned. The earlier European hospitals, before the great hospital scandal of the eighteenth century, which demonstrated most of them to be hotbeds of disease, were usually large, rambling, many-storied structures of the block or corridor type; or else dwelling houses, barracks, or other buildings abandoned to this purpose. Tenon's report, which first laid down the true principles of model hospital construction, insisted that the hospital

wards should be in isolated pavilions of definite dimensions and capacity, containing only a certain number of beds each, and with windows on opposite sides, extending to the ceiling. The object was to get the maximum of sunlight and fresh air into the wards, the ideal condition being 1200 cubic feet of fresh air for each bed or 3000 cubic feet per patient per hour. The merits of the pavilion system had been amply tested by Miss Nightingale's experience, in the Report of the English Barrack Commission of 1858 and in our own Civil War, but the true principles of hospital construction had not been officially adopted in our Army prior to the Surgeon-General's Circular of April 22, 1867. Most of the cuts of United States Army hospitals which Billings gives "are simply inserted," he says, "as samples of ingenious modes of 'how not to do it.'" The only hospitals he approved of were those at Fort Schuyler and that at Willet's Point (now Fort Totten,) built by General Abbot, of the Engineers, which he regarded as the best. He goes on to say:

> It is manifestly impracticable to plan a hospital which shall be equally suited to the burning mesas of Arizona and to the bleak North Atlantic coast. Nor can it be expected that the hospitals of a temporary post, often little more than a camp, shall be equal in structure and comfort to those of a permanent post. But even a log or a mud hut need not be built in absolute and direct defiance of all sanitary laws, and especially to be deprecated is the turning over of old barracks or officers' quarters to hospital use.

In those days, army hospitals were put up by contract without the co-operation of medical men, cheapness being the sole object. Billings says that if the money used for such big piles as the New York civil hospitals or the Rhode Island or Cincinnati hospitals were divided into two equal parts, and one half used for building an ordinary frame

hospital of the same capacity as these huge structures of stone and brick, the other half being put out at interest at six per cent., a complete new hospital could be substituted every twelve years for an indefinite period, with the advantage of avoiding "hospitalism," that mysterious and invisible enemy which made old hospitals veritable saturated nests of septicæmia, pyæmia, gangrene, erysipelas, and other modes of wound-infection. This was Billings's view up to the time when he entered upon the actual construction of the Johns Hopkins Hospital, but at that later period the ideas of Pasteur, Lister, and Semmelweis had gained universal acceptance, and he was in position to abandon the idea of temporary hospitals in favour of permanent structures, as of old. He concludes his report on the deficiencies in the proper care of United States troops as follows:

> The ultimate cause of the defect is, of course, ignorance, the immediate cause being a desire for economy, praiseworthy in itself, but producing results which are the reverse of its object; for a saving in boards and brick, at the expense of the health and life of the soldier, cannot be considered a commendable thrift. It is clearly both the interest and duty of the Government to reduce, as much as possible, the annual loss to the Army resulting from sickness, invaliding, desertion and death; and this can only be effected by a judicious application of the laws of sanitary science.

The report abounds in such shrewd observations as the following:

> When, at the same post and with the same troops, the accession of a new medical officer is followed by a marked increase or diminution of the number taken on sick report, or by a marked change in the nomenclature of diseases reported, while the general condition of, and the relative mortality at, the post remains the same, it seems fair to

presume that the change is due more to the doctor than to any other cause.

When a new physician arrives at a post the number "taken sick" usually increases at first, as those disposed to shirk duty, and the minor chronic cases will usually wish to try the new surgeon; but, after this temporary increase passes off, it is found that the ratio of sickness may vary as much as 40 per cent., depending on the physician. As this same cause of error must exist, more or less, in all medical statistics, but is seldom thought of, and, indeed, can only be determined under such circumstances as exist in the Army, I have thought it worth mentioning.

The following is of unusual interest under present conditions:

The whole system of military organization is an education and a preparation for emergencies and circumstances which may never occur. And as troops are drilled in the use of arms, though no enemy be present, so should they be familiar with the system which is necessary on the part of the medical department in time of war or epidemics. And to refuse to furnish the necessary accommodations and facilities to medical officers is very much like refusing to allow soldiers to use muskets, cannon, or horses in time of peace.

Our military system is, or should be, organized on the theory that it is to act as a nucleus and organizing power for the force to be called into existence in time of war. When a war breaks out we must have large hospitals; if these are to be efficient they must be thoroughly organized. The knowledge of this organization is best obtained by practising it previously on a small scale.

The report of 1875 on the hygiene of the United States Army (Circular No. 8) shows that, following the publication of Circular No. 4, things had taken a more favourable turn. In particular, the Adjutant-General's order of

1874 clearly defined the duties of the medical officers, so that any proper hygienic investigations made by them should not be regarded by their ranking officers of the line as "a species of espionage." In this report, Billings files a strong brief for the proper hygiene and personal well-being of the enlisted man. He reiterates his request for "cheap, strong bathing-tubs or other means of cleansing the whole body," and recommends jets or showers instead of tubs, particularly an octagonal system of shower baths around a stove, like that used at Rouen. He points out that one hundred men a year are lost through the respiratory diseases caused by overcrowding and bad ventilation.[1] "Every man should have his sixty feet of floor space as much as his ration." He is especially severe in condemnation of two-story beds, such as travellers endure on ocean liners, and from evils resulting from requiring the soldier to sleep without sheets or pillows. Again, since "armies travel upon their bellies," he fights the enlisted man's battle against any proposed reduction of rations, urging that the commutation value of an individual ration be at least twenty-five per cent. in excess of what is required, "to prevent suffering." He points out the need of plenty of ice at the southern posts, recommends that baking-powder and lime-juice be made part of the ration for scouts and expeditions, and, from his experience with scurvy in the Civil War, that canned tomatoes be issued at posts where fresh vegetables cannot be had. The regulation, then in force, of changing company cooks every ten days (practically disregarded in many cases) is discountenanced as very bad for the soldiers' welfare. He urges that the chief cook should be a permanent detail, specially enlisted, with extra pay, that schools for instruction of cooks should be established at recruiting stations,

[1] This is the same condition which Surgeon-General Gorgas found among the miners of the Rand, South Africa, in 1913–14.

as in the English service, and that a manual for instructions for cooks should be prepared, with diet tables and culinary directions for all climates and seasons. In discussing the military hospitals, he notes with approval that the medical officers now look after their construction and repair, and that, following the appropriation of June, 1872, $100,000 has been granted annually for this purpose. This, however, he still regards as insufficient. He gives descriptions of the West Point Hospital for cadets and the Barnes Hospital at the Soldiers' Home, a fifty-bed brick structure planned by him in 1873, as "two permanent and rather expensive hospitals" of the period. The barrack or temporary structures, to be torn down every ten years, were now fully in vogue, but Billings states the experience of the time to be that hospitalism could not be warded off even by the pavilion system. He points out that the real danger of hospitalism arises from the solid, probably living, organic particles, which saturate not only walls and floors but "baize screens, woollen clothing of attendants, upholstered furniture" as well as the dressings of wounds. He hints at our modern knowledge of living disease carriers when he says that "these organic poisons are necessarily more dangerous to others than to the one who produces them. The only available preventive, then, is a more minute classification and isolation of contagious cases." In discussing ventilation, he reports with candour upon his own proposal of a ventilating fireplace, which, tried out in about a dozen instances, did not turn out uniformly well, in part from defective construction of the stoves, but more particularly because such stoves, while heating well at ordinary temperatures, were total failures with the outside air below zero. He concludes that, under the latter condition, it would be impossible to heat and ventilate a barrack hospital at one and the same time, and recommends the use of ordinary

cast-iron cylinder stoves. His report concludes with a brief reference to the adobe houses used in the south-west, which, while held in dubious esteem by some, he regards as sanitary enough for temporary use.

About the time of this publication, Dr. Billings became active in the affairs of the American Public Health Association, of which he was made president in 1880. His first contribution to its transactions was a committee report on the plan, then under consideration, for a systematic sanitary survey of the United States, to which he appended a brief essay on medical topography in its historical and other relations. The plan, in brief, was based upon a series of upwards of four hundred questions, constituting a minute and searching inquiry into all aspects of the hygienic conditions of a given locality and the local and preventable causes of disease at that point. This *questionnaire*, the separate sections of which were carefully drawn up by different experts on Dr. Billings's committee, it was proposed to submit to all American cities and towns of five thousand inhabitants and upwards, there being at that time about 325 such localities in the United States. This idea of triangulating a vast territory in its hygienic and medical relations undoubtedly had its germ in the epoch-making work of Daniel Drake on the diseases of the Mississippi Valley. As to the value of the proposed survey, Dr. Billings remarks that: "It would establish the foundations of a national public hygiene in this country," and that "until some such sanitary survey is accomplished, state medicine in this country cannot take rank as a science, but must rest mainly upon individual opinion and hypotheses, as it now does."[1] It was a proposition involving the expenditure of much time, labour, and money, and it is needless to say that, given the large number of leading questions and the difficulty of getting

[1] *Am. Pub. Health Assoc. Papers and Reports, 1874–5*, N. Y., 1876, ii., 44.

any one to go to the trouble and expense of obtaining answers, the project was soon abandoned.

In 1879, Dr. Billings was appointed vice-president of the new and short-lived departure in public hygiene, the National Board of Health. This attempt at a central sanitary organization was organized by Act of Congress on March 3d, of the same year, and to it powers of large prophylactic scope were given by the National Quarantine Act of June 2d. Under the provisions of the Act of March 3d, this Board was to consist of a medical officer each of the Army, the Navy, and the Marine Hospital Service, and seven other members, to be appointed by the President or detailed with his approval. Of these, Dr. James L. Cabell, of Virginia, was appointed President, Dr. Billings, Vice-President, and Dr. Thomas J. Turner, United States Navy, Secretary. Among the other members were Dr. Preston H. Bailhache, of the Marine Hospital Service, Dr. Henry I. Bowditch, of Boston, and Dr. Stephen Smith, of New York. The Board was organized on April 2d, and met eight times during its first year of existence, at Atlanta, Nashville, and Washington, D. C. Many attempts to found such a national health council had been made, but had fallen through for various reasons, and the principal incentive for the legislation of March 3, 1879, was undoubtedly the yellow fever epidemic of 1878. This Act, which was strongly opposed by the Surgeon-General of the Marine Hospital Service, had been introduced and rushed through just before the close of the session of Congress. The duties of the Board were to obtain information upon all matters relating to public health, to advise the various Government departments, the executives of the several States, and the Commissioners of the District of Columbia on any questions of this kind which might arise; also to plan, in conjunction with the National Academy of Sciences, a proper scheme for a national

sanitary organization, especially in connection with quarantine. After conference with the National Academy and the leading sanitary organizations and sanitarians of the country, it was decided, by almost unanimous vote, that the Board itself was sufficient unto its ends, and should continue as such; that it should investigate various specific infectious diseases and make sanitary surveys of places likely to be visited by them; that it should devise uniform methods for collecting and reporting vital statistics and make suitable arrangements for rigorous quarantine, especially in relation to yellow fever. Among the important things accomplished by it during its first year of existence were the adoption of a definite scientific nomenclature of disease, in connection with which Dr. Billings was in active correspondence with the Royal College of Physicians of London, then making the decennial revision of its own nosological scheme; an investigation of yellow fever in Cuba by Drs. S. E. Chaillé, John Guiteras, Civil Engineer, T. S. Hardie, and Surgeon George M. Sternberg, United States Army; an investigation of the organic matter in the air by Professor Ira Remsen; of disinfectants by Drs. C. F. Folsom and Professor C. F. Chandler; of adulterations of food and drugs; of sewers, soils, and diseases of food-producing animals; and sanitary surveys around New York Harbour and in Memphis, Tennessee, which latter was under the special direction of Dr. Billings. In connection with quarantine, the Board decided, under the Act of June 2d, that the diseases necessitating closure of ports and exclusion of vessels would be cholera, yellow fever, plague, small-pox, relapsing and typhus fevers, but its functions were not clearly enough defined by the Act to give it full powers of quarantine. Conflict with local authorities as to the States rights principle restricted its activities and led, in the end, to its dissolution. This opposition, says Billings,

"came mainly from medical men, whose solicitude lest local self-government should be interfered with seems to have been much greater than that of business men or politicians." He points out that in spite of this the epidemic of yellow fever in the summer of 1879 was greatly restricted in Illinois and the Southern States, without necessitating the decrease of interstate commerce which had obtained during the epidemic of 1878. In 1880, Billings read to the Public Health Section of the American Medical Association, of which he was chairman, a review of the activities of the Board, "in order that some account of this new medical departure shall form a part of the records of this body, so that Macaulay's New Zealander will be able to prepare a full report on the subject, if he can only obtain a complete set of the *Transactions of the American Medical Association*." He points out that the creation of the Board was, in a sense, premature, as being forced into existence through a yellow fever scare, and that "as soon as this emergency had passed, it would find itself without the support of an educated public opinion, and upon such an opinion alone, under our form of government, can such an organization securely rest." This luminous sentence goes to the very heart of the difficulty encountered in advancing State medicine or any other phase of public welfare in this country. It had been objected against the proposed system of quarantine to be inaugurated by the Board of Health that the Northern States and cities took care of themselves in this respect and that it was unjust to tax the whole country in order to protect those Southern ports and cities which did not do likewise. To this Billings replied that the strength of a chain is precisely in its weakest link, that the mere interest on the money which had been raised during the last fifteen years by voluntary contributions in the North to aid the South, when stricken with yellow fever, would more than

pay the expenses of the quarantine proposed, and that the only remedy for the evils connected with local quarantines being the education of the people in this regard, "it seems, on the whole, expedient that the cost of this education should be borne by the general government." As to the National Board itself, he concludes that "for a premature birth, the infant seems healthy and lively, but it would be rash to make any prophecies as to its immediate future, since this depends so largely upon the contingencies of the next few months."

As a matter of fact, its operations extended over a number of years, during which time it published several bulky volumes of reports and four volumes of bulletins, containing, among other things of importance, Billings's reports on the registration of vital statistics and the proper nomenclature of disease; but its activities were gradually let and hindered by the usual States rights jealousies and the opposition of the then Surgeon-General of the Marine Hospital Service. The disputes fomented sometimes took on a serio-comic character. Billings was not the sort of man to remain long in an environment which did not suit him or in which little could be accomplished. Living up to the device, "environment wins," he resigned his vice-presidency in 1882. The Board itself, a premature birth, as he had described it, gradually died out from lack of appropriations about 1886. His helpful attitude towards it during its lifetime may be sensed from one or two of his letters to Sir Henry Acland (Oxford):

December 21, 1881. Congress is in session and I have been stirring up matters to have some action taken for properly draining the river front of this city to see whether it is not possible to free it from malaria. A special committee of the Senate is engaged on the matter and I am quite confident that

funds will be granted and work commenced in the spring. As to the National Board of Health, its prospects are good. I think this Congress will pass a law with regard to adulteration of food and drugs which will give the Board new duties.

April 17, 1882. The National Board of Health is going quietly on. I am organizing an investigation into malaria for it and hope for some good results. At all events, we can prove or disprove certain theories which have been advanced.

The period 1875–76 was an important one in Dr. Billings's life, for about this time he attained the national and international prominence which he had honestly earned by his arduous labours of the last five years. In 1875, his plans for the construction of the proposed Johns Hopkins Hospital were selected by the Trustees of the Foundation as the best, and for the next twenty-five years he was to be actively engaged in its construction and organization. In the same year he published his important *Bibliography of Cholera*, as part of the Government report on the cholera epidemic in the United States, giving the complete literature on the subject to that date. In the following year, he published his *Specimen Fasciculus* of a Catalogue of the Surgeon-General's Library, intended as a *ballon d' essai* for the future Index Catalogue. In the same year was published his centennial survey of the medical literature and institutions of the United States, in which he made his mark as an acute and discriminating judge in a field in which the earlier kind of writing had been florid, and for the most part uncritical. This appeared in the volume *A Century of American Medicine*, 1776–1876, and bears as a motto the scriptural "Wherefore, by their fruits ye shall know them." At the start, he makes a clean sweep of the colonial medical literature of America, as of little value:

At the commencement of the Revolutionary War, we had one medical book by an American author, three reprints, and about twenty pamphlets. The book referred to is the *Plain, Precise, Practical Remarks on the Treatment of Wounds and Fractures*, by Dr. John Jones, New York, 1775. It is simply a compilation from Ranby, Pott and others, and contains but one original observation, viz., a case of trephining followed by hernia cerebri.

After listing the books usually found in the libraries of the colonial physicians, and giving a brief account of the earlier medical schools and scientific academies, he passes in rapid review, Benjamin Rush, whose writings "excel in manner rather than matter," James Tytler, Noah Webster, William Curry, and Caspar Wistar, and discounts the medical theses of the time in the denunciation of Professor Gross that, in the last fifty years, "not one in fifty affords the slightest evidence of competency, proficiency, or ability, in the candidate for graduation." He singles out John Leigh's experimental study of opium as a contribution of value but, as starting with the year 1776, his survey omits all reference to the more important clinical contributions of William Douglas (1736), Thomas Cadwalader (1740), John Bard (1749), Samuel Bard (1771), and Hezekiah Beardsley (1788). The tendency of the rest of Billings's essay is for the most part extremely critical, even to the point of *nil admirari*, and it may be said that nothing was ever more needed in this country than a critique of this kind. American physicians of the period, even Marion Sims, had not grasped the Greek poet's idea, emphasized by Matthew Arnold in speaking of American literature, that "excellence dwells among rocks hardly accessible, and a man must almost wear his heart out before he can reach her. Whoever talks of excellence as common and abundant, is on the way to lose all right standard of excellence. And when the right standard of

excellence is lost, it is not likely that much which is excellent will be produced." It is safe to say that, after the publication of Billings's essay, and in connection with his subsequent publication of the Index Catalogue, the quality, and, in consequence, the status of American medical literature was materially improved. The names selected by Billings for especial approbation are Godman, Morton, Beaumont, the elder Mitchell, Drake, Gerhard, T. R. Beck, and Isaac Ray, and no one will challenge the accuracy of his selection as far as it goes. With men like Godman and Drake, whose early evolution was somewhat similar to his own and who were like him in perseverance and ability, he had an especial sympathy. He says nothing of the important clinical work of such men as Otto, James Jackson, father and son, Elisha North, John Ware, or Jacob Bigelow, names which again have only come into prominence of late years through the recent intensive study of clinical medicine. As a good example of the haphazard way in which the subject was studied in the early days, Billings instances the case of the "milk-sickness" or "trembles," described by Daniel Drake, in 1809, and concerning which four pamphlets and one hundred and ten journal articles had been written.

> It cannot be said to-day that we have any definite knowledge as to the pathology or causes of this affection, or that, so far as man is concerned, we are absolutely certain that there is any special disease which should be thus named. . . . It has been said to be caused by certain plants, yet no scientific experiments have been made on the effects of these plants. No attempt has been made to produce the disease in an animal remote from infested localities by the use of the suspected plants, or better, by the use of an extract containing the active principles; no chemical or microscopical examinations have been made; in short, we have nothing but an account of symptoms, and much of that is from hearsay.

The essay concludes with an exhaustive historical and statistical account of the medical periodicals, societies, libraries, museums, and medical schools of the United States. The concluding paragraphs are impressive and at the same time are the best statement, in a short space, of the actual conditions of American medicine in the Centennial year:

In attempting to estimate the quantity and value of the additions made by the medical profession of this country to the world's stock of knowledge of the laws of healthy and diseased action, and the means of modifying these actions, it is very difficult to make generalizations which shall be at once clear, comprehensive, and correct. This difficulty becomes an impossibility, if we are to speak of the education, mental characteristics, and professional qualifications of the whole body of physicians of this, or any other country, since only the most vague and indefinite statements will hold good. We have had, and still have, a very few men who love science for its own sake, whose chief pleasure is in original investigations, and to whom the practice of their profession is mainly, or only, of interest as furnishing material for observation and comparison. Such men are to be found for the most part only in large cities where libraries, hospitals, and laboratories are available for their needs, although some of them have preferred the smaller towns and villages as fields of labour. The work of our physicians of this class has been for the most part fragmentary, and is found in scattered papers and essays which have been pointed out in preceding essays; but buds and flowers, rather than ripened fruit, are what we have to offer. Of the highest grade of this class we have thus far produced no specimens; the John Hunter, or Virchow, of the United States, has not yet given any sign of existence.

We have in our cities, great and small, a much larger class of physicians whose principal object is to obtain money, or rather the social position, pleasures and power which money only can bestow. They are clear-headed, shrewd, practical

men, well educated, because "it pays" and for the same reason they take good care to be supplied with the best instruments, and the latest literature. Many of them take up specialties because the work is easier, and the hours of labour are more under their control than in general practice. They strive to become connected with hospitals and medical schools, not for the love of mental exertion, or of science for its own sake, but as a respectable means of advertising, and of obtaining consultations. They write and lecture to keep their names before the public, and they must do both well, or fall behind in the race. They have the greater part of the valuable practice, and their writings, which constitute the greater part of our medical literature, are respectable in quality and eminently useful.

They are the patrons of medical literature, the active working members of municipal medical societies, the men who are usually accepted as the representatives of the profession, not only here, but in all civilized countries; they may be famous physicians and great surgeons in the usual sense of the words, and as such and only as such, should they receive the honour which is justly their due. They work for the present, and they have their reward in their own generation.

There is another large class, whose defects in general culture and in knowledge of the latest improvements in medicine have been much dwelt upon by those disposed to take gloomy views of the condition of medical education in this country. The preliminary education of these physicians was defective, in some cases from lack of desire for it, but in the great majority from lack of opportunity, and their work in the medical school was confined to so much memorizing of text-books as was necessary to secure a diploma. In the course of practice they gradually obtain from personal experience, sometimes of a disagreeable kind, a knowledge of therapeutics, which enables them to treat the majority of their cases as successfully, perhaps, as their brethren more learned in theory. Occasionally they contribute a paper to a journal, or a report to a medical society; but they would rather talk than write, and find it very difficult to explain how or why they have suc-

ceeded, being like many excellent cooks in this respect. They are honest, conscientious, hard-working men, who are inclined to place great weight on their experience, and to be rather contemptuous of what they call "book learning and theories." To them our medical literature is indebted for a few interesting observations, and valuable suggestions in therapeutics but for the most part, their experience, being unrecorded, has but a local usefulness.

These three classes have been referred to simply for the purpose of calling attention to the fact that, in speaking of "the physicians of the United States," it is necessary to be careful. There are many other classes, and they shade into each other and into empiricism in many ways. In discussions upon this subject, it seems to be often assumed that all physicians should possess the same qualifications, and be educated to the same standard, which, in one respect, is like saying that they should all be six feet high, and in another, is like the army regulations, which prescribe the same ration and allowance of clothing for Maine and Florida, Alaska and Oregon. A young and energetic man who has spent six years in obtaining a university education, and four more in the study of medicine as it ought to be studied, that is to say, in preparing himself to study and investigate for the rest of his life, will not settle in certain districts. He has invested ten years' labour, and from five to ten thousand dollars, and a locality which will give him a maximum income of, perhaps, fifteen hundred dollars per annum will not be satisfactory, in part because the capital should bring a better interest, in part because he will have acquired tastes which will make his life unpleasant in such places. Yet these places must have physicians of some sort, and it is not clear as to how they are to be supplied, if some of the universal and extensive reforms in medical education which have been proposed are to be enforced.

Certainly the standard for admission and for graduation at almost all our medical schools is too low, and one-half, at least, of these schools have no sufficient reason for existence; but it is not probable that it would improve matters much to establish a uniform, which must, of course, be a minimum, standard.

Of the material aids and instruments required for the advancement of medical science, such as hospitals, libraries, and museums, we have obtained as much as could be expected. With the proper use of those we now possess will come the demand for, and the supply of, still better facilities for the work of the scholar and observer.

The defects in American medicine are much the same as those observed in other branches of science in this country, and to a great extent are due to the same causes.

Culture, to flourish, requires appreciation and sympathy, to such an extent, at least, that its utterances shall not seem to its audience as if in an unknown tongue.

We have no reason to boast, or to be ashamed of what we have thus far accomplished; it has been but a little while since we have been furnished with the means of investigation needed to give our observations that accuracy and precision which alone can entitle medicine to a place among the sciences properly so called; and we may begin the new century in the hope and belief that to us applies the bright side of the maxim of Cousin, "It is better to have a future than a past."

During 1879–80, Dr. Billings was president of the American Public Health Association. His address, delivered in New Orleans on December 7, 1880,[1] contains some good examples of wit and wisdom. At the outset, he takes the broadest view of sanitary science, maintaining that the constant investigation of the problem "what is life?" will always lead to results of positive value:

It is probable—that is to say, it is more than an even chance—that, if we knew the whole life-history of half a dozen minute organisms with the reactions which occur between these and surrounding media,—such as air, water, and organic matter of various kinds, dead or living,—we should know the causes of some of our most destructive diseases, and could proceed with their prevention upon truly scientific principles.

[1] *Am. Pub. Health Assoc., Papers and Reports*, 1880, Boston, 1881, vi., 1–11.

He next passes to the part played by the pulpit and the press in educating the public in matters hygienic:

Let the clergyman learn to recognize the real, palpable, material bogies which lie in his path, and how these are to be destroyed or driven away; let him obtain sufficient knowledge of the laws of physics, physiology, and existence, to keep him from certifying blindly to the efficiency of patent nostrums of various kinds; let him understand the difference between skin-plumbing and good work, between a properly ventilated church and one in which the occupants run great risks of either a headache or a cold; and it is safe to say that he will have doubled his usefulness.

And, as to the huge quantity of editorial writing on hygiene in the newspapers:

The daily or weekly newspaper is also doing effective work in diffusing sanitary information in this country. . . . At first sight an examination of this mass of matter might lead one to think that, as an indication of progress, it is a little like the register which the ingenious Irishman obtained from his gas-metre after he had put it on upside down, and so managed to bring the company in debt to him at the end of the month. . . . While much of the cheap and easy declamation about sanitary matters, which is so prevalent, is of the nature of an advertisement, yet the froth and scum show that there is a current beneath, and to a great extent show its direction. Slowly but steadily there has arisen, and is growing, a belief that much of our sickness and death is preventable; that we ought to be able to make our cities as healthy as the country; to lengthen the average duration, and increase the comfort of human life; and from people of all conditions, capitalists and labourers, from the mills and workshops of the North, the crowded streets of our great cities, and the low-lying, malarious prairies and swamps of the West and South, comes to the educated and thinking men of the country—to the engineers and lawyers and legislators, as

well as to the physicians—a demand to put away these plagues which consume our children.

Next as to the fact that vigorous health often flourishes under insanitary conditions:

So far as personal hygiene is concerned, each man must, to a great extent, be a law unto himself, and learn by personal experience what to do and what to avoid, though the experience often kills him about the time the lesson has been acquired.

The young man in good health and spirits, who hardly knows that he has a stomach, has a sort of good-humoured contempt for those who advise prudence as regards tobacco or liquor, late suppers, etc., and is inclined to think that his mentors "would, if they could"; in which he is not always wholly wrong, for it is one thing to preach, and another to practise. From another point of view, it may seem that we have little or no power over the causes of disease, and that, as Parkes suggested, it may not be intended that man should be healthy. This is going back to the old Greek fate 'Ανάγκη Δαιμόνων.

The foundation upon which all science rests, is the belief that like causes, under like circumstances, produce like effects.

"The curse causeless shall not come." We do not believe that disease comes by chance, or by the intervention of special providences, but in accordance with fixed laws; and we are by no means disposed to fold our hands in a despairing Nihilism. "Do not let us devote ourselves to the Fates, while we yet may have hope in the Gods."

As to the opposition of municipal governments who "will spend millions on marble city halls and civic displays, and yet withhold the few thousands necessary to provide properly lighted and ventilated schoolhouses for their children," he says:

Cassandra, the unfortunate daughter of Priam, doomed to foresee the coming evils, but powerless to obtain belief in her predictions, or to induce effort to avert the impending storm,

is a type in more ways than one of the educated sanitarian of to-day. Yet the cry of "wolf" may be raised so often without sufficient grounds, that the public will become indifferent. It does not easily distinguish between the voice of the really skilled scientific man and the echoes of the pseudo-sanitarian and alarmist; and in this branch of knowledge, as in those spoken of by Goethe, "the voices are few, though the echoes are many."

The principal obstacle to proper sanitary legislation was the almost stationary character of the law and of the minds of its luminaries also. "When the sanitary fat does get into the political fire, there is a terrible sizzling, and the result is often disastrous." Little is held out to the professional sanitarian in the way of compensation, and he is hindered by the hopelessly inexact methods of recording vital and medical statistics. To secure an accurate mode of registration of these and "to take an account of stock by making a sanitary survey" are, Dr. Billings holds, the two things of paramount importance at this time, and, he predicts that, if these were accomplished, all other objects in view would flow from them as a natural consequence. As to the average human equation, he quotes with approval, Bentham, who says, that "in the ordinary tenure of human life there is a general habit of self-preference, which is not a reasonable cause of regret, but is an indispensable condition to the well-being of man. Here and there may be found a man who will sacrifice self-interest to social interest; but such men are not more frequent than insane." Yet none the less, he urges the pioneers in social reform to advance bravely, even though "like Saul, the son of Kish, they go forth to find their father's asses, and they don't have to hunt long."

In another address delivered before the same Association, he says:

Architects now often pay some attention to problems of ventilation, drainage, etc.; but it seems to me that the members of the legal profession have not given sufficient consideration to the subject of public health . . . in short, that we need some sanitary lawyers in this Association, and in official positions where they can originate or direct legislation relating to this specialty.[1]

In the summer of 1879, the city of Memphis, Tennessee, was visited by a formidable epidemic of yellow fever. This was the first epidemic which the National Board of Health attempted to deal with and they demonstrated that it could be got under control without seriously interfering with commerce. In November of the same year, a committee of the National Board, consisting of Dr. Billings, Dr. Charles F. Folsom of Boston, Col. George E. Waring, Jr., and others, was requested to co-operate with a committee of fifteen,—in examining into and reporting upon the sanitary condition of Memphis. Billings outlined his plan of action in a series of searching questions, informally put, at the first meeting of the conjoined committee, and after a thorough sanitary survey of the city, made his report on November 28, 1879. He pointed out that many dwelling-houses and buildings in Memphis were nests of infection by reason of cellars underneath, containing privy vaults and cisterns contaminated by seepage from such vaults, and that the same thing was true of the junkshops and the general sanitary condition of the Bayou Gayoso. He recommended that not only all rags, old bedding, and other junkshop material but even unsanitary buildings and shanties should be destroyed by the old Mosaic rite of incineration; that the city should have a proper system of sewerage upon plans recommended by Colonel Waring; that there should be scientific building regulations; and

[1] *Am. Pub. Health Assoc., Reports and Papers*, 1875–6, New York, 1877, iii., 52.

that the streets should be paved with gravel, with gutters and curbs of concrete. This report not only met with no opposition, but was adopted, as it were, by acclamation. The visiting sanitarians were banqueted, and Dr. Billings was regarded with a feeling of gratitude which is voiced in the *Memphis Appeal* (newspaper) of Sunday, January 18, 1880:

To say that to him is due, more than to any other one individual, the present reassuring prospect for the sanitary regeneration of Memphis might, though indisputably true, seem invidious if some explanation were not also offered of the advantages inherent in his position as an officer of the Army Medical Corps, and hence free from all the limitations and embarrassments which, of necessity, beset the civilian. . . . His clear, incisive utterances, his direct level-headed exposition of our disease, and the heroic measures of treatment he prescribes for our relief, have been received by the most diverse and conflicting interests with an unquestioning acceptance which would be denied him were he one of our own citizens or even a civilian from abroad, no matter what his eminence or his reputation. . . . Dr. Billings's visit was a moral tonic, which has invigorated and strengthened every one engaged in the work of rehabilitating the Bluff City.

In the *International Review* for January, 1880, Billings summed up his experiences with yellow fever in a fascinating paper, which was perhaps the most important essay on the subject in its time. The opening paragraphs, designed to arrest the reader's attention are "literature" in the proper sense:

Since the beginning of the eighteenth century seamen have had occasion to notice that sometimes, after a visit to certain ports in the West Indies or in Central or South America, a mysterious something has entered their ships,—a something which may in a few days turn the vessel into a floating pest-

house, or which may show no signs of its presence for days or weeks, and yet at the end of the voyage may promptly destroy a stranger entering the hold; which might attack all the sailors sleeping on one side of the ship and leave the rest unharmed,—in short an invisible, impalpable entity presenting so many peculiarities in its results that it was the most natural thing in the world to imagine it as being endowed with the attributes of purpose and will, and to speak of it as "Bronze John" or "Yellow Jack."

This tendency to personify yellow fever is strong among all who are familiar with it, and physicians and nurses who have had much experience of its vagaries often speak of them, and of Yellow Jack, in much the same terms as they would speak of a highly disreputable but very interesting acquaintance,—a sort of Bohemian among diseases. Its course in a city has been compared to that of a tax collector passing from house to house along a street, often only one side of a street. It is usually stopped by prison or convent walls, sometimes affecting but a few squares, and again developing in a week into one of the most terrible of epidemics. Those who have seen most of it are as a rule least dogmatic in their assertions with regard to it; and those who are well satisfied as to the nature of its cause, and are ready to demonstrate precisely how its occurrence or spread may be prevented, will usually be found to have had little personal experience of its eccentricities.

He points out that the clinical phenomena of the disease suggest a cause which "is either itself capable of growth and reproduction outside the bodies of the sick, or that it is the product of something which has these qualities. In other words, the cause may be a minute organism, somewhat like the yeast plant; or it may be the product of such an organism, like alcohol." In the closely reasoned paragraphs that follow, there occur a number of remarkable sentences in which the writer's mind, like a pointer dog in leash, seems hot upon the trail of the true causal agent

of the disease, which was destined to be discovered, twenty years later, by his friend and brother officer, Major Walter Reed[1]:

Many of the phenomena of the disease resemble those produced by the venom of the cobra or rattlesnake; and if such snakes could not live more than four months unless they bite a human being, the analogy would be still more close.

The belief that the disease ever spontaneously originates from combinations of filth, heat, moisture, and the presence of unprotected persons is an exercise of pure faith with which science has nothing to do at present, as there is no evidence in its favour, and certainly, if this combination could produce it, we should long ago have heard of its appearance in the tropical ports of Asia, or in ships visiting the inter-tropical Pacific, whereas it has never occurred at these points. Sanitary shriekings about filth have had and still have their utility in calling public attention to the evils of uncleanliness of air, food, drink, or persons, but they soon lose their power when used by amateur hygienists as their sole stock in trade. . . . There are, however, two forms of decaying organic matter whose presence has been so often connected with outbreaks of yellow fever that they require special notice. The first is in decaying wood, as in old ships, piers, wharves, wooden pavements, etc. The second is in the presence of large quantities of rotting and very offensive seaweed mixed with dead fish, animals, etc., which has immediately preceded several epidemics on the Gulf coast.

As regards clothing, bedding, etc., it is often urged that their destruction by fire is the best method of dealing with them. As a matter of fact the attempt to carry out such destruction by fire has often resulted in a spread of the disease, —as in Memphis in 1878, where the clouds of smoke from the

[1] Major Reed once said to the writer that it was the highest ambition of his life to succeed Colonel Billings as Librarian of the Surgeon-General's Office. Billings, with his unerring judgment of men, had indeed selected Reed for that position, which he was destined to hold, in due course, for the single week, which ended, alas! with his untimely death.

burning of infected bedding in the streets seemed to be almost literally the wings of pestilence, so certainly did fresh outbreaks of the disease appear in the direction in which the cloud drifted. This is due, not to the smoke itself, but to the currents of air caused by the heat, and to the disturbance of the infected material. . . . In cold weather thorough ventilation and exposure of stuffs to the cold of three or four nights will render them harmless, and the more they are disturbed and shaken while thus exposed the better.

The great mass of the people agree with the old farmer that "yellow fever can't go anywhere unless yer tote it!"

Three years after Reed's discovery, in addressing the army medical graduates, Billings remarked, in a jesting aside, that had anyone, in those early days, suggested mosquitoes as possible vectors of yellow fever, he would have been sent across the river to the asylum at St. Elizabeth's. The rest of his essay is taken up with an exhaustive consideration of the most rational means of preventing the disease, in regard to which he concludes that, in the then state of knowledge, the best agency would be the education of public opinion strengthened by some strong federal power which might intervene at need in exceptional cases. All in all, this essay is one of the most striking productions of a mind which was in advance of its time.

CHAPTER IV

THE JOHNS HOPKINS HOSPITAL AND MEDICAL SCHOOL

ONE morning in the spring of 1876, a number of gentlemen, the Trustees of the Johns Hopkins Fund, visited the Library of the Surgeon-General's Office for the purpose of conferring with Dr. Billings as to the best ways and means of furthering the momentous project they had in hand. The details of the conference have not been recorded, but they were so satisfactory to the Trustees that, on June 28th of the same year,[1] Dr. Billings was selected by them as their Medical Advisor and, after obtaining the consent of Surgeon-General Barnes, he forwarded his letter of acceptance on September 18th.

The seal of the Johns Hopkins Hospital bears the inscription "Incorporated 1867." On March 10, 1873, Mr. Johns Hopkins, a wealthy merchant and banker of Baltimore, Maryland, addressed a communication to the Trustees of this corporation, recording the fact that he had devised to them thirteen acres of land (bounded by Wolfe, Monument, Broadway, and Jefferson streets), upon which to erect a hospital, and setting forth his wishes as to the planning and execution of the project.

[1] In a letter from Francis T. King, President of the Board of Trustees, dated July 22, 1876, and now on file in the records of the Johns Hopkins Hospital.

These involved no specific directions as to the structure of the necessary buildings, indeed, as in the case of the Johns Hopkins University, the donor expressly declined to trammel his Trustees with petty details. "I will furnish the means," he once said, "and they must build the Hospital." What he did specify was that a special fund of two million dollars in real estate, yielding an annual revenue of $120,000, should be so managed by careful stewardship as to be made more productive if possible. The annual interest was to be devoted to the erection of the hospital and to a home for orphan coloured children. It was further specified that the hospital should be for the benefit of the indigent sick of Baltimore and its environs, "without regard to sex, age or colour," and also for the reception of a limited number of pay patients; that the medical and surgical staff should be of the highest character; that a training school for female nurses should be established in connection with the hospital, as also dispensary accommodations; that the hospital should be free from any sectarian influences; and that it should ultimately form part of the Medical School of the University, and thus further the cause of scientific research and of medical education. In the third paragraph of these instructions it was stated that the plan should "provide for a hospital which shall, in structure and arrangement, compare favourably with any other institution of like character in this country or in Europe." As Dr. Billings said, long after, this phrase

coming from a shrewd business man and a member of the Society of Friends, signifies, I think, to excel, if possible; at all events, that is the safest interpretation. And it was not this or that hospital which was to be surpassed or equalled but all other hospitals in this country or in Europe; Africa, Asia and Australia being put out of the question. It was a large contract.



The Johns Hopkins Hospital, Baltimore, Md.

Johns Hopkins died on December 24, 1873, and, in his will he bequeathed the remainder of his estate to the Hospital and University, being an endowment of nearly three and a half million dollars to each. On March 6, 1875, the Trustees sent out a circular letter to five experts in hospital construction in this country, requesting that plans be sent in setting forth their ideas as to construction, heating, ventilation, and administration, with diagrammatic sketches in pen or pencil, the separate plans to be ready by the first of May. These plans were duly received from the five physicians in question, Drs. John S. Billings, Norton Folsom, Joseph Jones, Casper Morris, and Stephen Smith, and of these plans that of Dr. Billings was selected as the best. It offered alternate plans for one- or two-storied buildings, but the author strongly advised two-story pavilions as affording better administration; and several ideas were submitted as to the arrangement of the separate structures, those specially recommended by Billings himself combining the advantages of the pavilion idea with the more recent idea of detached buildings as hospital units. The author further specified that the administration of the hospital should be upon the military or railroad plan, that is, under one head and only one; that it should have first-class physiological and pathological laboratories, a dispensary for out-patient relief, and that this department should be connected with the building set apart for the instruction of students and separated from the administration buildings; that clinical instruction should be mostly given in the wards and out-patient department and not in an amphitheatre, except in the surgical unit; that medical cases should not be brought from beds to an amphitheatre; that there should be graded accommodations for pay and private patients in rooms or suites of rooms; that there should be two pharmacies and a training school for nurses; and that

a perfect system of records, financial, historical, and clinical, should be kept. As will appear, Billings laid especial stress at the start on the necessity of a medical school of much higher status than had hitherto existed in this country, providing liberally for the accommodation of resident students. He also recommended the publication of annual volumes of reports, like those of Guy's or St. Bartholomew's Hospitals. In regard to Johns Hopkins's request that the institution be non-sectarian he says: "I recommend that no chaplain be appointed, although a chapel should be provided." In regard to the matter of contagion, he gives what was then known as to the pathogenic theory of micro-organisms, citing Burdon Sanderson's report of 1869–70, and points out the necessity of isolation wards not only for infectious cases, but also "to prevent patients with depraved appetites from perpetuating or renewing their maladies by recourse to the original cause." In regard to the training of nurses, he says:

> If a suitable woman can be obtained for chief cook, the main kitchen would be a valuable aid to the Training School. I have never seen such a woman, and my personal experience in large hospitals is that it is better to employ as chief cook a first-class man, in which case the instructions of the nurses in cooking will be mainly given in the diet-kitchens attached to the wards.

After the acceptance of Dr. Billings's plans by the committee, the plans of the architect proper were drawn up and adapted to them, and in connection with these Billings made a series of reports to Mr. King, the President of the Trustees, which are his most valuable and enduring contributions to the subject of hospital construction and organization. In the first of these, of date July 15, 1876, he broaches the question whether it would be better to put up a hospital costing over a million dollars, or to count the

cost and by curtailing various expenses reduce the amount so that the balance could be applied to educational and scientific purposes. After giving the necessary calculations, he proceeds to develop his own views, in a remarkably direct and convincing manner as follows:

The Hospital should contribute to Charity, Education and Science. First to Charity. It is to furnish the best possible care and treatment to the sick. Its patients are to have the benefit of the best medical and surgical skill which can be procured, of properly trained nurses, of pure air and proper food, and they are not to be subjected to any annoyances or depressing influences by being made a show of in any way.

Their treatment by the Hospital authorities is to be in the same spirit in which they would be treated in their own homes.

I wish to make my views on this point distinctly and clearly understood, even at the risk of being tedious. A sick man enters the Hospital to have his pain relieved—his disease cured. To this end the mental influences brought to bear upon him are always important, sometimes more so than the physical. He needs sympathy and encouragement as much as medicine. He is not to have his feelings hurt by being, against his will, brought before a large class of unsympathetic, noisy students, to be lectured over as if he were a curious sort of beetle. Some men, and even women, are perfectly indifferent to being thus displayed, in fact rather like it, but there are many who regard it with aversion and fear, and will undergo much privation and suffering in their miserable homes rather than subject themselves to the exposure above referred to.

In this Hospital I propose that he shall have nothing of the sort to fear.

In these blunt terms, Billings makes a clean sweep of the old-fashioned tedious didactic clinical lecture, with a patient on exhibition in the amphitheatre as a sort of freak, and, at the same time, shows how to do away

with the ancient and well-founded horror of hospitals which had existed in the minds of the ignorant as well as the intelligent laity up to the end of the nineteenth century. But, he goes on to say, the functions of such a charity as Johns Hopkins proposed is not to be limited to the care and treatment of the sick:

This Hospital should advance our knowledge of the causes, symptoms and pathology of disease, and methods of treatment, so that its good work shall not be confined to the city of Baltimore or the State of Maryland, but shall in part consist in furnishing more knowledge of disease and more power to control it, for the benefit of the sick and afflicted of all countries and of all future time.

It should be remembered that our buildings and machinery are simply tools and instruments, that the real Hospital, the moving and animating soul of the institution, which is to do its work and determine its character, consists of the brains to be put in it. Whether it shall be a truly great Hospital and a charity such as was intended by its founder, is not a matter solely of arrangement and plan of buildings, it depends upon not more than half-a-dozen men and one or two women.

If cheap buildings were therefore to be run up, the effect would be not to save money to be applied to other purposes, but merely to open the hospital about two and a half years earlier than by the other arrangement:

If we had as our sole object the care of the sick poor of the city of Baltimore, dealing with it as a contractor would do, we might perhaps accept this view.

But this Hospital is also to assist in educating physicians, in training nurses, in promoting discoveries in medicine, and the buildings required for these purposes cannot be made fit for their purpose with the smaller sum, neither can the saving proposed be by any means a clear gain, because of the increased amount of annual repairs which the cheaper buildings must entail.

I have intimated that the most difficult thing in forming this Hospital is not to plan the buildings, to decide how they shall be heated, or whether the ventilation shall be by a central aspirating shaft or otherwise; it is to find the proper and suitable persons to be the soul and motive power of the institution, but it is also true that the plan and arrangement of the buildings will have a powerful influence upon those who are to manage the Hospital, stimulating them to exertion in certain directions, checking them in others, for carrying the analogy of the Hospital to a living organism a little farther—the body influences the soul as well as the soul the body.

The next question considered by Billings is how to obtain the best men for the hospital and this, he holds, will be accomplished, not so much by holding out attractive salaries, as by offering every facility for the furtherance of scientific observation and experiment:

We can much more certainly secure men who will minutely and patiently investigate individual cases, noting every abnormal appearance or sound, testing every excretion, recording the precise effects of each plan of medication, in short doing everything that science can suggest to understand the condition of the patient and the best method of relieving him; by showing them that they shall have space and apparatus to work with, that the resources of modern science and mechanical skill shall be at their command, and that any discoveries which they may make shall be properly published, than by simply offering double pay.

But each man, however good and capable and admirable, is a problem in himself, and must be tried out to ascertain his true worth:

Again, to secure these skilled physicians; original investigators imbued with the true scientific spirit; gentlemen; a certain amount of experiment and probation will be necessary. In very few cases indeed is it possible to say at first, "This is

precisely the man we want for the place." They must be taken on trial. This trial cannot be satisfactory if we do not furnish the means. Such men as are wanted will at once request the means if they do not find them provided. Those who will not trouble the Trustees for more than they provide—and who will be the better pleased the less that they provide, are not the kind of men to be sought for.

But the mere acquisition of capable men as members of a medical faculty is only the beginning of a difficult problem, and herein lies the conclusion of the whole matter:

After we have got our good men we want to keep them good. For our purposes there is no such thing as a man who "knows enough." They are to improve steadily, to grow mentally, and for this growth we must provide nutriment and space just as certainly as we must provide them for the trees which we propose to plant, or else expect stunting, impaired vitality, and absence of fruit. The buildings are to be arranged with reference to these considerations, and it will be found that in the plans proposed no more space has been allowed for this purpose than is really advantageous. I not only cannot recommend any reduction in the general administration buildings or service buildings of the wards, but I think it would be judicious to increase a little the space allowed in some of these structures.

The same reasoning is extended to the proposition of a training school for nurses and to the education of medical students proper. In nearly all American medical schools of the day, Billings points out, even the primary object of turning out good average practitioners is imperfectly attained:

But there are other objects for a Medical School which do not at all enter into the plan of existing institutions. One of these is to train men to be original investigators, to bring them

face to face with the innumerable problems relating to life, disease and death, which are yet to be solved; to inspire them with the desire to investigate these questions; and to give them the training of the special senses, of manual dexterity, and, above all, of clearness and logical scientific precision of thought, which are required to fit them to be explorers in this field.

To do this, I think, should be one of the objects of this Medical School.

Another need, "which is supplied by no medical school in existence," was for the proper training of public sanitary officers, and two branches which Billings recommends for special attention are the diagnosis, treatment, and jurisprudence of insanity and a special course in pediatrics. The next point he insists upon is that the students' knowledge is "not to be mainly acquired from text-books or lectures, but from observation, experiment and personal investigation."

What the teacher can do is to inspire in the student the desire to learn, show him how to work, give him facilities and encourage him, and smooth over difficulties.

To do all this implies every facility in the way of rooms, instruments, and apparatus, teaching in laboratories, wards, and dead-house, and small classes: "Lecturing will be the smallest part of the duty of these professors." No time must be wasted on men not fitted to receive such instruction and suitable students must be sifted out at the start by rigorous preliminary examinations. In the earlier part of their studies pupils should occupy themselves with "principles, theories and general formulæ, and this belongs exclusively to the university." Outside of rare surgical operations, the first-year student will see little of hospital work. But after this time, "the

student is to apply the principles to practice, is to receive clinical instruction, is clinically to instruct himself. To this end he must see and examine cases of disease, he must work in the Hospital and Dispensary." And in furthering such instructions, it is perfectly possible that "the comfort and welfare of the patients shall not only be not injured but be promoted by the presence of these students":

> Reflect a moment as to what sort of persons these students, selected and trained as I have indicated, will be, and do not let the word "student" mislead you into taking for granted that they will correspond in tastes, habits or manners to the ordinary ideal of a medical student. There will be as much difference as there is between an architect and a bricklayer.

To this end, Billings again insists that classes should be small, that the whole of the graduating class should be employed in the hospital, that this number cannot exceed twenty-five, making the maximum number of students about 120. "I think there will not be more than ten students ready for the hospital advantages by 1880." After reviewing the wishes expressed in Johns Hopkins's will, Billings finally proposes that either a hospital costing at least one million dollars plus four years' income be erected, or, failing this, "that *all* the buildings be built with regard to cheapness mainly, at a total cost of about $350,000, abandoning entirely the general plan of which I have been speaking." He clenches this alternative by the following bold statement: "I advise that no attempt at a compromise between these two courses be made, for if it is, the result will be satisfactory to nobody."

After considering the probable date of construction, organization, and inception of the Hospital and Medical School, he concludes by recommending that these questions be deferred until after his prospective visit to Europe to

obtain necessary data, and that the work of grading and excavation be postponed until the following spring.

The substance of this classical report has been given in detail on account of its historic interest and because it shows Billings at his best in his straightforward energetic way of grappling with a difficult problem and forcing its issues upon his readers or auditors.

On October 7, 1876, Dr. Billings, in company with Dr. Ezra M. Hunt, a well-known sanitarian, sailed from Boston on the S. S. *Batavia* arriving at Queenstown on October 16th. The progress of his trip abroad is outlined in his letters to his wife.

Boston, October 3, 1876. Arrived at New Haven at 11 A.M. Spent the day with Dr. and Mrs. Bacon looking at Yale College. I was much interested in the picture gallery, which contains the best of the Trumbull pictures, and especially about a dozen miniatures. . . . To-morrow I read my paper and after that will have time to go round. Met Dr. Holmes, who remembered me at once and was very cordial.

October 4. To-night have got to alter my paper into an address to be given to-morrow night to take the place of one of the great guns who has failed to appear.

October 5. I am a little annoyed that my paper, which was to be merely a brief memorandum, is to be forced into the position of a popular address to-night but I must do as well as I can. . . . I have got the ugliest, coarsest, heaviest ulster I ever saw in my life, have got some "British gold," and am all ready to go, I believe.

October 8. S. S. *Batavia*, somewhere near Nova Scotia. We sailed according to programme, Dr. Bowditch going to the steamer with me and waving good-bye as we left the wharf.

October 9. Dr. H., feeling better, came on deck this morning with his stovepipe hat on and an umbrella spread. The

Captain immediately stepped up to him and, with an air of great interest, inquired if he were going ashore. I think Dr. H. will not appear in that rig again. We have a passenger on board who has crossed six times and is always sick nearly the whole voyage. He made his preparations with a sort of cheerful despair which was very comic, and he is now on deck with lack-lustre eyes, pale face and bedraggled expression over which, when anyone speaks to him, he forces a smile, and such a smile.

October 12. It has been raining and storming in a mild way for two days. Can't go on deck, so drift around in the saloon and the smoking room, doing nothing in particular. It is curious that I do not even care to read but simply lounge around and look vacuous. The ship is rolling and pitching in such a way that writing is by no means easy; one moment you are leaning away from the table in a very erect and dignified manner, and the next moment you are leaning over it with your nose within six inches of the cloth. My spine is getting very flexible by exercise.

October 22. Morley's Hotel, London. I am seated in front of Trafalgar Square, with Nelson's monument opposite, around the base of which are four most magnificent lions. Have not seen much of London yet. Dine to-night with Erichsen, to-morrow with Brunton, the next day with Ernest Hart, editor, *British Medical Journal.* Find that I have little use for letters of introduction, my name seems well known and my card is enough. Am engaged for dinner every day this week. Shall probably meet Jean Ingelow. This place is too big; it is about three miles to anywhere, and if it were not for hansom cabs, I could not get on at all. . . . Everything is new and odd, not altogether pleasant, but invaluable as an experience. . . . Have only seen the sun once for a few minutes since I landed. Fog or rain all the time. I have been to two hospitals, St. Paul's Cathedral, London Bridge, the Monument and Hyde Park, and have ridden on the top of an omnibus along the Strand, Cheapside, Piccadilly, etc.,

from Trafalgar Square to the Bank, seeing things at every step, of which I have heard since I was a boy. The hotel is comfortable, good food but little variety in it, feather bed which worries me, no gas in bed-rooms, nothing but one dim candle. If you want breakfast before 9:30, it must be specially ordered, which I do with great regularity, to the disgust of the waiters. Had to get a stiff hat, which makes my head ache. Dr. H. sees more sights than I, but I see more men than he. . . . Went out for a walk, although it was raining a little, so did not go very far before we came to Westminster Abbey, a grand old building, which however does not impress one so much from the outside, as it is dwarfed in appearance by the houses of Parliament, just across the street. We went in and found service going on, and a crowd of people occupying the floor. The music was grand and the whole effect was more impressive than anything I ever dreamed of. The tops of the enormously high Gothic arches were lost in space except where some stained glass windows glowed like gems, the blue dome, lighted by candelabræ giving a very sublime radiance, and everything was a thousand years old or looked as if it might be. The door we had gone in opened into "Poet's Corner" and there were statues and memorials of the great men we have heard of and whose dust rests below. As we went out, right over the corner was one monument with the shortest inscription of all: "O rare Ben Jonson." I went to St. Paul's Cathedral yesterday but it was simply big and I cannot say that I was moved or impressed. . . . I can understand now a little of the "certain condescension in foreigners" of which Lowell spoke. What extremely poor affairs almost all our buildings and statues are, although I never knew it before with any realizing sense of the thing.

October 23. Dined with Mr. Erichsen last night.

October 24. Yesterday I explored St. Thomas's Hospital, the Houses of Parliament, and the British Museum. Dined last night with Lauder Brunton and saw Norman Lockyer, the editor of *Nature*, and the finest fellow I have met yet,

Dr. Burdon Sanderson, a very great man indeed, and Dr. Fothergill.

October 27. I dined last night at the Saville Club with Huxley, Lockyer, Sir Joseph Fayrer, Ferrier and three or four more. Sunday evening I am to spend with Huxley at his house. Spent Wednesday at Oxford and had a gorgeous time. . . . To-morrow I go to Cambridge, and, returning, go down the river with Beck. Sunday morning I breakfast with Corfield, lunch with MacCormac, sup with Huxley; Monday morning to South Kensington, lunch with Lockyer and start for Amsterdam in the afternoon.

November 3. Hotel Hauffe, Leipzig. I have visited the collection of pictures here and have seen most of the sights, which indeed are not very remarkable. It does not at all equal Cologne in quaintness and strangeness.

November 6. Hotel de Rome, Berlin. Berlin is a great city, as large as New York, and with the finest architecture I have yet seen. . . . I took tea with Professor Thiersch, the Dean of the Medical Department of the University. His wife is the daughter of the great chemist Liebig. He had three distinguished pundits to meet me, and the tea lasted until one A.M., when we rose from the table. It was the jolliest tea party I ever saw or ever expect to see. I find that what little German I know helps me a great deal. I can get about without trouble and ask for everything I want.

November 10. Hotel Kron Prinz, Dresden. On my arrival in Dresden, I found Dr. Roth, Surgeon-General of the Saxon Army, with two of his staff awaiting me at the depot, and all arrangements have been made that I shall see everything that is worth seeing, and there is very much here that interests me, both in a scientific and an æsthetic point of view. . . . What I have seen of the architecture does not equal Berlin, and the monuments and sculpture are much more defaced by smoke, being more like London in that respect.

November 13. Hotel Metropole, Vienna. It is still cold and damp and raw, very depressing weather for sight-seers, the picture galleries are mostly not heated and the few people who visit them go shivering around over the stone floors with cold feet and red noses, and hurry through with the show as fast as possible. There are many statues in the open places through the city, but they have all got snow wigs on and look as if a good fire under them would help things a good deal. The hotel I am in is inside the old part of the city, on the Franz Josef's Quay, and about it are the queerest, narrowest, crookedest streets you can imagine, wide enough for one cart and no more. I was in St. Stephan's Cathedral to-day; it is large, gloomy and grand, but by no means equal to the cathedral at Cologne. The picture gallery in the Belvedere here is very fine, not quite so good as the one in Dresden, but containing many famous pictures by Rubens, Van Dyke, Rembrandt, Paul Veronese and others. I have been in the great Hospital here to-day; it has nearly three thousand sick people in it, and it was very melancholy to walk through one room after another, all filled with men or women or children, each suffering in some way. Many of the people here are very, very poor. I see them in the streets very thinly dressed and blue with cold. They use small carts here pulled by dogs, and sometimes I see a dog and a boy, or a dog and a woman, pulling side by side. In the middle of this hotel is an open court with a glass roof and the breakfast and dining rooms open on this court with wide piazzas. The court is heated, so I took breakfast and dinner at a little table out on the piazza, where it was very light and pleasant. In the centre of the court is a great table covered with newspapers, and among these I was glad to see the New York *Herald* of October 24. To-morrow morning I am going to take breakfast with the American minister, Mr. Edward F. Beale. Breakfast at half past eleven o'clock, rather late for me, don't you think? . . . I am upon the whole getting very tired, and wish I were at home with you all once more. There is no place that is so comfortable as 84 Gay Street after all.

November 18. Grand Hotel, de la Tour des Londres! Verona. This is far the quaintest and most interesting city I have yet been in. Yesterday I was in the cathedral and saw Titian's picture of the Assumption; in half a dozen churches, each more interesting than the other; in Dante's house, and in the palace of the Capulets—looking at the balcony where Juliet saw Romeo, or perhaps it was Romeo who saw Juliet. Venice and Verona made me feel very melancholy; they are crumbling away and only here and there are feeble efforts made to repair and preserve. Beggars and priests are everywhere, and, in the cities, everything looks poor and more or less in want.

November 18. 9:00 P.M. Grand Hotel Royal, Milan. I have just come in from an hour's stroll through this very curious city. The cathedral surpasses my expectations and though not so imposing in height as that at Cologne, is far more elaborate and beautiful. It seems almost impossible that such lace work could be done in stone. I have been through the grand arcade of shops, all of which were brilliantly lighted and made a most imposing display. Don't imagine that things are cheap here, for really good and beautiful articles one must pay as in New York. The ride over from Verona to-day was through one of the most beautiful valleys in Italy, along the foot of the Apennines. The country is cultivated like a garden.

November 19. Grand Hotel Royal, Milan. To-day, though Sunday, has been a very busy one with me. I have examined two hospitals, been all over the Cathedral—on top and down in the crypt, where I saw the tomb of St. somebody, all in silver *repoussé* work, which cost over a million of dollars; have been through the picture gallery, the Arena, seen Da Vinci's picture of the *Last Supper*, etc., and am pretty nearly ready to go to bed and get some rest.

November 28. Hotel de la Couronne, Paris. 6 P.M. Paris is a superb place to be in; no other city that I have seen presents so many ways of amusing one's self and so much to see.

On December 16th, Dr. Billings embarked from Liverpool on the Cunard steamer *Russia*, having visited all the hospitals and medical schools in the cities mentioned in his itinerary. While in England, he made many valuable acquaintances destined to become fast friends in after-life. Among these were Dr. Henry W. Acland of Oxford, Professor Huxley, Professor Michael Foster, Dr. William M. Ord, and Lister, from whom he received the following letter:

9 Charlotte Square, Edinburgh,
5th Dec., 1876.

Dear Dr. Billings:

We have been talking of you lately and wondering whether you had abandoned your idea of visiting Europe this year; and now we are pleased to learn that such is not the case. If it suited you to call at my house about 10 o'clock on Saturday morning, we could arrange about meeting at the Infirmary on that day. We should be very glad that Dr. Hunt and you should make our house your home during your stay in Edinburgh if it would suit your convenience to do so. In any case we hope you will both dine with us quietly on Saturday and talk over subjects of mutual interest; and on Monday evening we shall hope to have some professional friends to meet you. Mrs. Lister joins in kind remembrances to you, with

Yours very sincerely,
Joseph Lister.

Prior to Dr. Billings's visit to Europe, the five plans of the several competitors had been subjected to a close and careful criticism by the architect of the Hospital, Mr. John R. Niernsée, who also made a revision of Dr. Billings's estimates of the probable cost; and the plans drawn up by Mr. Niernsée himself, based upon the sketch plans of Billings, were in turn reviewed by the latter (July 15, 1876), in the report already mentioned. Upon his return from Europe, Billings presented a third report

giving a summary of his investigations abroad on January 11, 1877, including some racy paragraphs on the then European conditions. He regards the English schools as, on the whole, the best for beginners in medicine, those of France and Germany requiring a "very considerable stock of preliminary knowledge," if good results are to be obtained.

> In the German schools there seems to me to be a little too much of the forcing process in the stimulating to and requiring of original work, instead of trying to fit a man to do original work.
>
> The student is led to think that his highest aim should be to do some experiment which no one has done before, and for this purpose he may work for a year in the laboratory, and yet acquire but a tithe of the knowledge which he goes there to obtain. As a rule it seems better that specialism should follow and not precede general culture; if the foundation is narrow the superstructure cannot be wide or firm.

The plans submitted to the various authorities met with general approval everywhere, but beyond the general trend of preference towards one-story wards, opinion as to construction and management, heating and ventilation, was chaotic. Billings found that his reputation as a constructor of barrack hospitals in war-time had preceded him:

> I do not think we have much to learn from Europe as regards the general principles of hospital construction. . . . Surprise was freely expressed at my coming from America to Europe to learn about hospitals.

As regards ventilation, each person consulted thought his own system the best, although he could give no reasons for the assertion in most cases. Billings notes the marked improvements brought about in hospital statistics by the

antiseptic or Listerian method and how, in many of the older hospitals, defects of plan and construction were compensated for by good administration, while in better hospitals of more recent type which were supposed to run of themselves, evil results were sometimes manifest. As to the question of female nurses, Billings gives a drastic critique of the Nightingale system, in particular of the idea that the lady superintendent of nurses should be independent of the superintendent of the hospital and responsible only to the trustees, the ideal of "an independent female hierarchy, which will consider from the very commencement, that one of its main objects is to be independent of all males, who are to be considered as the natural enemies of the organization." At this time, most of the nurses at St. Thomas's Hospital, he claims, fell short of the Nightingale ideal of "refined educated women, fitted to move in good society," being rather "of the class from which the better kind of English domestic servants are obtained." He adds that "the denunciations of attempts to govern women by men are not worth considering, except as indicating that those who utter them are not desirable persons to be associated with in an institution of this kind." He recommends the New Haven system of a superintendent of nurses and a matron, who shall be subordinated to the authorities of the hospital, and also the experiment of trying a few male nurses. In regard to another matter, Billings is equally breezy and positive:

> If a female nurse is a properly organized and healthy woman, she will certainly at times be subject to strong temptation under which occasionally one will fall, and this occurs in all hospitals where women are employed, without any exception whatever. Something may be done, however, to remove opportunities—and I believe the construction proposed effects this as far as it is worth while to attempt it.

After some consideration of ventilation and heating, which Billings deals with in a very general way, preferring to develop the details in connection with the actual process of construction, he concludes his report with a recommendation that the revised plan be adopted.

The fresh plans having been approved by the Board of Trustees on April 17, 1877, the Building Committee was authorized to proceed with the construction of buildings on the west front, and the superintendent of construction entered on his duties on May 8, 1877. The hospital grounds were enclosed by a fence, and at the end of the year, excavations for the cellars of the main building and pay wards and nurses' home had been made, the lot was drained, foundations laid, and walls of the principal buildings begun. Sketches for the elevation of the main building and pay wards, forming the west or principal front of the hospital, were prepared by Messrs. Cabot and Chandler of Boston and approved by the Trustees. The style of architecture adopted was Queen Anne, the material brick, with trimmings of the dark blue Cheat River stone. On February 12, 1878, Dr. Billings presented his full report on the system of heating and ventilation to be adopted, which, as he remarked, was specially devised to be suitable to the climate of Baltimore and the peculiar location and plan of the hospital. On January 23, 1882, he reported to the Building Committee that in view of the superior style of construction employed and the decided increase in the price of labour and materials, the estimated total cost of the Hospital had advanced from $1,028,500 to $1,610,-372.29 and that, in consequence of this, it would require about six and one-half years more to complete the Hospital on an estimated annual income of $125,000. The question arose whether the Dispensary and the Octagon Ward, then in process of completion, should be thrown open to the sick poor and employed for clinical instruction. In a

report of April 4, 1882, Dr. Alan P. Smith and Mr. John W. Garrett found that this could be done without trenching upon the principal of the trust, and represented that the hospital could be opened on September 1, 1883. On account of the necessity of slowly paying for the construction of the hospital out of its annual income, this was not to be until six years later.

In the final plans, the wards were in single story pavilions, and to ward off the miasms and malarial emanations which, under Pettenkofer's *Boden* theory were then supposed to emanate from the soil, the basement was left unoccupied by patients, and

> wherever there was any communication between the basement and the first story, such as by flues communicating with radiators in the basement, even when they conveyed hot air, a thick coat of asphalt should be spread beneath them so that the floor might be wholly impervious to any exhalations from the soil. . . . No elevators were permitted in the buildings because of the danger of communicating infection from one story to the other.[1]

The ventilation was secured "not only by natural currents of air introduced from without," but also by "the removal of impure air from apartments by means of exhaust fans, and high shaft with accelerating coils." "No building up to that time, or since," says Hurd, "had more enlightened arrangements for fresh and pure air, or more perfect construction of apparatus for heating and ventilation."[2]

In reviewing the plans at the Billings Memorial Meeting at the Hospital in May 26, 1913,[3] Hurd points out that

> the whole structure was too much upon the line of the army hospital. It was deficient in modern facilities for nursing and

[1] H. M. Hurd, *Johns Hopkins Hosp. Bull.*, Baltimore, 1914, xxv., 245.
[2] *Loc. cit.* [3] *Loc. cit.*

in the modern laboratories for studying disease. The sink rooms, ward bathrooms, linen rooms, etc., were too small, and not arranged for the convenience of nurses. They seemed to contemplate the presence of the army orderly at every turn. There was also imperfect provision for housekeeping and storerooms and other conveniences, which housekeepers love to plan and sometimes to use. The operating rooms were also inadequate and not sufficiently studied in the light of present demands of modern surgery.

But he admits that "these were minor defects and were incident to the times and not to any oversight on his part." "These plans," he says, "influenced hospitals in a way unparalleled in the history of hospital construction," and gave "a tremendous impetus to better hospitals by directing the attention of medical men, sanitarians, and others to the absolute necessity of certain great essentials, viz., more perfect ventilation and heating and the prevention of contagion."

In 1877–78 and after, Dr. Billings gave a course of twenty lectures on the history of medicine, medical legislation, and medical education, in relation to the future university teaching in the Hospital. In this course, the lesson of medical history, the strange recurrence of certain medical theories in different periods, was deliberately applied to the elucidation of the status of medical education in such periods. These lectures, an example of what the modern Germans call *historische Medizin*, or applied historical medicine as distinguished from medical history proper, exist in manuscript, forming a carefully prepared monograph which deserves to be printed. One of them, the "Suggestions on Medical Education," printed in 1878, was followed, in 1893, by a "Condensed Statement of the Requirements of the Principal University Medical Schools in Europe with Regard to Candidates for the Degree of Doctor of Medicine," which Dr. Billings pre-

pared at the request of Mr. Charles J. M. Gwinn, one of the Trustees. It is an interleaved pamphlet of twenty-five pages, giving the requisite data for the leading university schools of Great Britain, Germany, France, Sweden, and Italy in concise form. It is, in some respects, a forerunner of the famous reports made by Mr. Abraham Flexner, nearly twenty years later, but the treatment is entirely impersonal and no criticisms or suggestions are advanced. It proved of great help in determining the requirements for admission and graduation. In the "Suggestions" of 1878, he goes very minutely into the possible or probable lines to be followed in medical teaching in the Hospital, and even urges special courses in comparative pathology, medical history and bibliography, state medicine and public hygiene, statistics, sanitary engineering, forensic medicine, and advanced courses for officers of the Army and Navy. He concludes that

> if this plan be approved and followed, it is probable that none of us will live long enough to see the perfect fruits of it. Yet it does not seem to me to be a mere vague dream that those fruits, in the shape of additions to human knowledge and human happiness, in the shape of men of whom this country may well be proud, and in the shape of honour and fame for the institution which has produced such results,—will surely come, come for our children's children, though not for us.

On May 7, 1889, the Johns Hopkins Hospital was formally opened in the presence of a distinguished audience with a prayer by Rev. Joseph T. Smith, followed by addresses by Mr. Francis T. King, Dr. Billings, and President Daniel C. Gilman. Mr. King, in his address, pointed out that seventeen buildings had been constructed and furnished, fourteen and a half acres of ground enclosed and beautified, without taking a dollar from the principal placed

in the hands of the Trustees, and with an actual increase of the endowment by $113,000 through judicious investments. The Trustees, as he said, had not failed in this part of their duty. Dr. Billings, after specifying the conditions set forth in Johns Hopkins's original letter of instructions, proceeded to show how far they had been complied with, giving incidentally a clear description of the Hospital as it stands. "As regards construction," he said, "I do not hesitate to affirm that these are the best built buildings of their kind in the world." He points out how the ventilation and heating had to be adapted to the temperature of Baltimore, varying from 103 degrees in the shade to 17 degrees below zero F., in other words, one which would answer for the tropics or northern Russia; how the wards are heated from central boilers, by the circulation of eighty thousand gallons of water through the complex system of hot-water coils; how accumulation of dust and dirt is avoided in the wards by the substitution of curves for rectangular corners and the avoiding of mouldings about panels; how all the patients in the isolation wards have rooms to themselves which open into a corridor through which wind is always blowing; and how all pipes and traps are either exposed to view or can be seen by merely opening a door, while, under ordinary conditions, they "remain a profound mystery to everyone except the plumber, and often puzzle even him." After describing the facilities for medical instruction, the pathological laboratory, the nurses' home, and the dispensary, he pays a well-deserved tribute to the architects and supervisors of construction, to the designer of the grounds, Mr. E. W. Bowditch of Boston, and to the President of the Board and Chairman of the Building Committee through the whole progress of the work, Mr. Francis T. King. One feature of his address is a neat history of the evolution of the hospital idea:

The first hospitals were established to give shelter and food to the sick poor, especially those who gathered in cities. Gradually physicians found that they could learn much in these aggregations of suffering and that they afforded the means of teaching others; but this last use of them is only about two hundred years old. Gradually, also, it came to be known that the knowledge thus obtained in the care of the sick poor was of use in treating the diseases of the well-to-do; and finally, within the last twenty-five years or so, people are beginning to find out that when they are afflicted with certain forms of disease or injury they can be better treated in a properly appointed hospital than they can be in their own homes, no matter how costly or luxurious these may be. In the hospital they can have not only all the comforts of home, but more; not only skilled medical attendance and skilled nursing, but the use of many appliances and arrangements specially devised for the comfort and welfare of the sick which can hardly be found in any private house, and also freedom from noise and many petty annoyances, including in some cases too much sympathy and in others too little.

Billings concludes with a luminous presentation of the functions of a modern hospital:

A hospital is a living organism, made up of many different parts, having different functions, but all these must be in due proportion and relation to each other, and to the environment, to produce the desired general results. The stream of life which runs through it is incessantly changing; patients and nurses and doctors come and go; to-day it has to deal with the results of an epidemic, to-morrow with those of an explosion or a fire; the reputation of its physicians or surgeons attracts those suffering from a particular form of disease, and as the one changes so do the others. Its work is never done; its equipment is never complete; it is always in need of new means of diagnosis, of new instruments and medicines; it is to try all things and hold fast to that which is good.

"Et quoniam variant morbi, variabimus artes."

It has been said that "hospitals are in some sort the measure of the civilization of a people," but a hospital of this kind should be more than an index. It should be an active force in the community in which it is placed. When the mediæval priest established in each great city in France a Hôtel Dieu, a place for God's hospitality, it was in the interests of charity as he understood it, including both the helping of the sick poor and the affording to those who were neither sick nor poor an opportunity and a stimulus to help their fellow-men; and doubtless the cause of humanity and religion was advanced more by the effect on the givers than on the receivers. It is the old lesson so often expounded, apparently so simple, and yet so hard to learn, that true happiness lies in helping others; that it is more blessed to give than to receive.

In some respects we to-day have a much wider outlook than the men of a thousand years ago. This hospital is designed, as I have told you, to advance medical science as well as to give relief to the sick poor, but the fundamental motive is the same —to help others.

We have here the beginning of an institution which shall endure long after the speakers and the audience of to-day shall have finished their life-work and have passed away. Founded in the interest of suffering humanity, intimately connected with a great university, amply provided with what is at present known to be essential to its work, we have every reason to predict for it a long and prosperous career, with steadily progressing improvement in its organization and methods, and enlargement of its activity and influence.

Let us hope that before the last sands have run out from beneath the feet of the years of the nineteenth century it will have become a model of its kind, and that upon the centennial of its anniversary it will be a hospital which shall still compare favourably, not only in structure and arrangement, but also in results achieved, with any other institution of like character in existence.

Dr. Billings's *Description of the Johns Hopkins Hospital*, a quarto of 116 pages, illustrated with 56 plates, was published in 1890, and became a kind of text-book on the subject of hospital construction and ventilation.

On January 22, 1889, President Daniel C. Gilman had been appointed interim Director of the Hospital, pending the selection of a permanent Superintendent, Dr. Billings meanwhile continuing his duties as Advisor. On June 18, 1889, Dr. Henry M. Hurd, of Union City, Michigan, was elected Superintendent of the Hospital, assuming his office on August 1st, after which it was agreed that the duties of Dr. Billings and President Gilman should cease and determine. In the meanwhile, the members of the medical and surgical staff had been selected. The earliest of these appointments to be made was that of Professor William H. Welch, of Norfolk, Connecticut, to the chair of pathology in 1884. This important selection was made largely at the instance of Dr. Billings and of Professor Julius Cohnheim of Breslau, in whose laboratory Professor Welch had made a distinguished record. In connection with the banquet given in honour of Professor Welch in Baltimore on April 2, 1910, Dr. Billings referred to his first meeting with him as follows:

Probably I have known Doctor Welch longer than any one who will be present at the dinner. I first met him over thirty years ago when he was a student in Ludwig's laboratory in Leipsic, when Kronecker was assistant professor. I listened to his account of his work, went with him to Auerbach's Keller where we discoursed *de omnibus rebus*, and as the result of these two talks, I said to Mr. Francis King, the President of the Johns Hopkins Hospital, who was with me in Leipsic, that that young man should be, in my opinion, one of the first men to be secured when the time came to begin the medical school. After Dr. Welch returned to America, the reports of his teaching and research work in New York, which came to

me, confirmed this opinion, and the result was that he was the first man appointed as Professor in the Johns Hopkins Medical School. Of what his work has been in this school, I need say nothing, the best part of it is the men whom he has trained and inspired.

With Billings, Gilman, and Professor Newell Martin, Welch played an important part in the organization of the Johns Hopkins Medical School, and through his own scientific work and that of his pupils, he practically introduced the new subjects of experimental pathology and bacteriology in American medicine. On September 25, 1888, Dr. William Osler, of Bond Head, Canada, who had been professor of medicine at the University of Pennsylvania since 1884, was elected Physician-in-Chief to the Hospital, and he too was a selection of Dr. Billings. As Osler himself relates:

An important interview I had with him illustrates the man and his methods. Early in the spring of 1889 he came to my rooms, Walnut Street, Philadelphia. We had heard a great deal about the Johns Hopkins Hospital, and knowing that he was virtually in charge, it at once flashed across my mind that he had come in connexion with it. Without sitting down, he asked me abruptly, "Will you take charge of the Medical Department of the Johns Hopkins Hospital?" Without a moment's hesitation I answered, "Yes." "See Welch about the details; we are to open very soon. I am very busy to-day, good-morning," and he was off, having been in my room not more than a couple of minutes."[1]

Until he was awarded the blue ribbon of the profession, the Regius Professorship of Medicine at Oxford in 1904, Osler laboured continuously at the chief end of his life-work, the teaching of clinical medicine in the wards, in which he made an epoch in this country. He made many

[1] Sir W. Osler, *Brit. Med. Jour.*, London, 1913, i., 641.

important contributions to his subject, wrote the best text-book on the practice of medicine in English (1892), and turned out a long line of worthy pupils.

Other appointments followed in due course, in particular those of Professor William S. Halsted of New York to the chair of surgery on March 11, 1889, Professor Howard A. Kelly of Camden, New Jersey, to the chair of gynecology, Professors William S. Thayer (internal medicine), J. Whitridge Williams (obstetrics), Henry M. Thomas (neurology), and around these were soon grouped a brilliant cluster of younger men, L. F. Barker, Simon Flexner, W. T. Councilman, H. A. Lafleur, Charles P. Emerson, A. C. Abbott, Thomas S. Cullen, and others.

With such a faculty as this, great advances in medical teaching were made from the start. In accordance with Billings's suggestions, the original work done at the Hospital was published in special Reports or in the Hospital Bulletin, the first number of which (1890) contains a demonstration of rare medical books by Billings. Billings himself lectured continuously on the history of medicine for a number of years, and, after his time, the subject was taught in the wards and by means of the Hospital Historical Club, at which the utterances of Welch and Osler were inspiring and suggestive. Osler required his pupils to read and report upon the foreign medical journals and, in ward and clinic, or in his evenings with his "boys" at home, aimed to develop the delicate art of self-direction in young men, giving them by suggestion, humorous or kindly, the proper ideals of the ethics and etiquette of their profession. His influence upon his Johns Hopkins pupils was not unlike that of General Robert E. Lee upon his soldiers, that of a fascinating, high-bred personality, and it would be difficult to estimate the value of his example in giving inspiration and uplift to ingenuous youth, a trait perhaps summed up in the

maxim of Vauvenargues: *Les grandes pensées viennent du cœur.*

That Billings should have chosen Osler, a character so utterly different from his cool, impersonal self, is an index of his rare knowledge of men and of his capacity to appreciate traits which lay outside his own personality. The same spirit, stimulating the students to work not for show but for higher ends, not by the compulsion of authority but through the creation of an inspiring environment, has been consistently maintained by the other leading professors of the medical faculty, Welch, Halsted, and Kelly. Of Welch, Professor Thayer has said:

> What suggestion and encouragement did we all receive from the delightful talks when the "Father" as we lovingly called him—when we didn't call him "Popsy"— passed from desk to desk, and from his words at the meetings of the little medical society in the hospital library. But that inspiration was for no small group of men. One by one these students have carried abroad his spirit and his teachings until there is scarcely a laboratory in this country that does not contain men who owe their success to that which Welch has given them.

By 1893, the Medical School was in full swing, and its faculty soon established a well-deserved reputation, at home and abroad, for original scientific work. In Welch's laboratory, Nuttall, Flexner, Councilman, Mall, Abbott, Wright, Sternberg, Walter Reed, and many others were trained, and out of it came his own original work on the experimental production of diphtheria by its toxins, on the bacteriology of wound infection, on the gas bacillus and the diseases produced by it, as also the work of Walter Reed on the pathology of typhoid fever, of MacCallum and Opie on the malarial parasite, of Opie on pancreatic diabetes, of Thayer and Blumer on gonorrhœal endocarditis. Reed, Carroll, and Lazear, who discovered the causation

and prevention of yellow fever, were all pupils of Welch. From Osler's clinic came the extensive studies of malarial fever by Thayer and others, of amœbic dysentery by Councilman and Lafleur, of eosinophilia by Thayer and Brown, of pneumothorax by Emerson.

The early numbers of the Hospital Bulletin contain Halsted's operations for inguinal hernia and amputation of the breast, Kelly's operation of hysterorrhaphy, and many of his other gynecological innovations. In the dermatological clinic, Gilchrist described blastomycosis and Schenck sporotrichosis. From the Hunterian laboratory came the experimental work of Cushing and his pupils on the pituitary body and its diseases, and in pharmacology, Crowe's investigation of hexamethylenamin, Rowntree and Geraghty's test in kidney disease, and Abel's method of vividiffusion. The *Journal of Experimental Medicine* founded by Welch (1896), and continued by Simon Flexner, and Abel's *Journal of Pharmacology and Therapeutics* (1909) are among the finest of our scientific medical periodicals, and the treatises of Whitridge Williams on obstetrics and Howard Kelly on medical and surgical gynecology, illustrated with Max Brödel's beautiful drawings, are recognized as the best current American books on these subjects. The Training School for Nurses, opened on October 9, 1889, has a well-established reputation, and the Psychiatric Clinic, donated by Henry Phipps, and opened on April 16, 1913, has established a new departure in the care and treatment of the insane. Under the administration of Dr. Winford H. Smith and Rupert Norton, who succeeded Dr. Hurd, and of Professor Lewellys F. Barker, who succeeded Osler as Physician-in-chief in 1904, the Johns Hopkins Hospital has kept well abreast of the times in the advancement of scientific medicine, and its medical graduates have carried the spirit of its teachings all over the United States. In

1913, through Mr. Rockefeller's gift of the Welch endowment, internal medicine, surgery, and pediatrics will in future be taught by "full time" professors.

Henry James, in *The American Scene*, gives the following impressionistic view of the Johns Hopkins Hospital:

> Why should the great Hospital, with its endless chambers of woe, its whole air as of *most* directly and advisedly facing, as the hospitals of the world go, the question of the immensities of pain—why should such an impression actually have turned, under the spell, to fine poetry, to a mere shining vision of the conditions, the high beauty of applied science? The conditions, positively, as I think of them after the interval, make the poetry—the large art, above all, by which, in a place bristling with its terrible tale, everything was made to seem fair and fairest even while it most intimately concurred in the work. In short if the Hospital was fundamentally Universitarian—as of the domain of the great Medical Faculty—so it partook for me, in its own way, of the University glamour, and so the tempered morning, and the shaded splendour, and the passive rows, the grim human alignments that became, in their cool vistas, delicate "symphonies in white," and, more even than anything else, the pair of gallant young Doctors who ruled, for me, so gently, the whole still concert, abide with me, collectively, as agents of the higher tone.

Thus Billings was a true prophet. All the fine things he had predicted for the Hospital, twelve years before its completion, came to pass in time. This home of the higher medicine did, in effect, realize the dreams and hopes of generations, as if, in the words of Goethe's *Chorus Mysticus*, the unattainable had at length become reality.

With Eliot of Harvard and Pepper of Philadelphia, Billings will always be remembered in our medical history as one of those who have dared greatly and achieved greatly for the advancement of higher medical education in this country.

CHAPTER V

THE SURGEON-GENERAL'S LIBRARY AND CATALOGUE

SOME time prior to 1836, there existed in the Surgeon-General's Office at Washington a small collection of books which had been made for official use by General Joseph Lovell,[1] who had been appointed Surgeon-General of the Army in 1818. In 1840, there was prepared a manuscript catalogue of this small office collection which shows, by actual count, that it consisted of 135 works, comprising 228 volumes. Dr. William A. Hammond became Surgeon-General on April 28, 1862, and was on duty in Washington until August 30, 1863. During his official residence in Washington, 359 volumes were purchased for the Surgeon-General's Library, the principal items being sets of the *Annales d'hygiène* and the *Boston Medical and Surgical Journal*, making the total number of volumes 587. On May 10, 1864, under Surgeon-General Joseph K. Barnes, a small interleaved catalogue was prepared and published, showing that at this time, the collection comprised 1365 volumes, the new accessions having been mainly selected by Drs. J. J. Woodward and George A. Otis. This was the first printed catalogue of the Surgeon-General's Library. In December 31, 1864, Dr. Billings was assigned to duty in the office, acquiring among other things, nominal, though not official, care of this

[1] J. S. Billings, *Med. Record*, New York, 1880, xvii., 299.

collection of books. On October 23, 1865, another catalogue was printed, consisting of 602 entries, comprising 2253 volumes. The growth of the collection from this date was due to the fact that the Surgeon-General was permitted to use for this purpose a "slush-fund" of $80,000 turned in from the Army hospitals at the close of the Civil War,[1] and is indicated by the printed catalogues of June 12, 1868, containing 2887 entries (6066 volumes), and of 1871, including 13,330 volumes. Prior to 1871, all these were author catalogues, but the latter, a handsomely printed volume with leading titles in bold-faced type, has subject entries as well. The introductory "Memorandum" of this volume contains the following paragraph:

> That there is need in this country of a medical library of this character is sufficiently evident from the fact that, in all the public medical libraries of the United States put together, it would not be possible to verify from the original authorities the references given by standard English or German authors, such as Hennen, Reynolds, or Virchow. No complete collection of American medical literature is in existence; and the most complete, if in this country, is in private hands, and not accessible to the public; while every year adds to the difficulty of forming such a collection as the Government should possess. The books are now safely and conveniently arranged in the fire-proof building of the Army Medical Museum, and are accessible to the public under rules and regulations essentially the same as those for the Library of Congress.

Between 1865 and 1887, the Army Medical Museum was, in effect, the old Ford's Theatre, in which President Lincoln was assassinated. The Surgeon-General's Office proper, during this period, consisted of a series of rooms (on either side of a central corridor) over the old Riggs's Bank, at the corner of Fifteenth Street and Pennsylvania Avenue.

[1] S. Weir Mitchell, *Science*, N. Y., 1913, n. s., xxxviii., 830.



The Army Medical Library, Washington, D. C.

Here, among other official business, all new accessions in the way of books, pamphlets, and theses were ticketed and catalogued, after which, they were sent to the Library hall in the Ford's Theatre, which was then in charge of Dr. Thomas A. Wise. So small were the accommodations over Riggs's Bank, that the newly arrived boxes of books and theses had to be opened in the back yard.

In the *Catalogue* of 1871, already mentioned, the arrangement of authors and subjects is in a single alphabet. In 1873, a three-volume catalogue, the first to be officially prepared under Dr. Billings's direction, was published consisting of anonymous works arranged by subjects, in alphabetical order, with lists of transactions, reports, and periodicals. In his introductory notice to this catalogue, Dr. Billings states that "the Library now contains about 25,000 volumes and 15,000 single pamphlets, and the present catalogue gives about 50,000 titles exclusive of cross references," the excess in titles being due to some 713 bound volumes of pamphlets and about 700 volumes of French theses. Nearly 4000 single theses and pamphlets, he states, have been deposited in the Library by the Library of Congress.

In 1876, Dr. Billings published a *Specimen Fasciculus of a Catalogue of the National Medical Library, under the Direction of the Surgeon-General, United States Army,* which was submitted to the medical profession for criticisms and suggestions. In style and arrangement, this publication is practically identical with the present *Index Catalogue*, differing only in certain typographical details. The index of authors and subjects is arranged in dictionary order in a single alphabet, the articles indexed from periodicals are printed in alphabetical order in nonpareil type, and the larger subjects, *e. g.*, Abdomen, Abscess, Acids, etc., are carefully subdivided. At this time, the Library contained about forty thousand volumes and about the

same number of pamphlets. In the preface, Dr. Billings says:

I cannot doubt that if a sufficient number of the catalogue, of which this is a specimen, be printed, and distributed to our medical writers and teachers, so that they may at their leisure learn what aid they can obtain in their researches, no collection of the Government will be more used or be of more practical utility; that it will soon tend to elevate the standard of medical education, literature, and scholarship of the nation, and will thus indirectly be for the benefit of the whole country, since the general knowledge and skill of the medical profession become a matter of personal interest to almost every individual at some time during the course of his life.

The *Specimen Fasciculus* was extremely well received by the medical profession. In his Dedicatory Address at the opening of the Boston Medical Library on December 3, 1878,[1] Dr. Oliver Wendell Holmes referred to it as follows:

The *Specimen Fasciculus of a Catalogue of the National Medical Library*, prepared under the direction of Dr. Billings, the librarian, would have excited the admiration of Haller, the master scholar in medical science of the last century, or rather of the profession in all centuries, and if carried out as it is begun will be to the nineteenth all and more than all that the three Bibliothecæ—Anatomica, Chirurgica, and Medicinæ-Practicæ—were to the eighteenth century. I cannot forget the story that Agassiz was so fond of telling of the King of Prussia and Fichte. It was after the humiliation and spoliation of the kingdom by Napoleon that the monarch asked the philosopher what could be done to regain the lost position of the nation. "Found a great university, Sire," was the answer, and so it was that in the year 1810 the world-renowned University of Berlin came into being. I believe that we in this

[1] *Am. Jour. Med. Sc.*, Phila., Dec., 1878, p. 751.

country can do better than found a national university, whose professors shall be nominated in caucuses, go in and out, perhaps, like postmasters, with every change of administration, and deal with science in the face of their constituency as the courtier did with time when his sovereign asked him what o'clock it was: "Whatever hour your majesty pleases." But when we have a noble library like that at Washington, and a librarian of exceptional qualifications like the gentleman who now holds that office, I believe that a liberal appropriation by Congress to carry out a conscientious work for the advancement of sound knowledge and the bettering of human conditions, like that which Dr. Billings has so well begun, would redound greatly to the honour of the nation. It ought to be willing to be at some charge to make its treasures useful to its citizens, and, for its own sake, especially to that class which has charge of health, public and private.

The necessary appropriations for the Library were eventually made by Congress, upon which its collection of books gradually expanded from year to year up to its present numerical status of half a million volumes. But Dr. Billings did not rest content with appropriations. By means of gifts and exchanges and by ransacking such private collections as were generously thrown open to him he laboured indefatigably towards completing his collection, obtaining in this way many rare desiderata and filling up many lacunæ. Dr. Holmes has humorously described a visit of Billings to his private library in Cambridge, how, directly upon entering the room, he swept the shelves with a keen glance, selected the most valuable book in the collection with unerring precision, looked at it a moment, put it back on the shelves, took another look around, and easily found the second book in the scale of values. "Why sir," said Dr. Holmes, "Dr. Billings is a bibliophile of such eminence that I regard him as

a positive danger to the owner of a library, if he is ever let loose in it alone."

The methods employed by Billings in handling and classifying new medical literature were very simple. Upon the accession of a new book or pamphlet, it is properly stamped, numbered, registered, and ticketed in the usual way, after which two entry cards are written: (1) an author card, giving author's full name, the title-page in full, pagination, size, place of publication, publisher, and date of publication. On the back of this card the date of accession is pencilled, also whether it is bound or unbound, and, if a pamphlet, the number of the box in which it is stored or the volume of miscellanies in which it is bound. The author card is thus the final authority as to the location of any given book in the library. These cards, together with cross references to the names of editors or collaborators, are arranged in strictly alphabetical order, constituting the author catalogue of the Library. (2) A subject card, giving author's name with initials, full title, size, place, and date of publication. In the case of articles indexed in periodicals only a subject card is written. Over the top of each of these cards is pencilled its proper place in the subject classification, *e. g.*, Liver (*Cirrhosis of, Treatment of*). The cards are then classified by their subject headings, as indicated *in extenso* in the *Index Catalogue*. This simple alphabetical arrangement by rubrics dispenses with all the inconveniences encountered in the method of attaching arbitrary numerals to the different items in a scheme of classification and its subdivisions.

Shortly after the publication of the *Specimen Fasciculus*, Dr. Billings gained the valuable assistance of Dr. Robert Fletcher, who was to be his faithful coadjutor throughout the first series of the *Index Catalogue*, and who was to carry on the redaction of the major part of the second

series after its founder's retirement from active service in the Army. Dr. Fletcher, who was assigned to duty in the Surgeon-General's Office on September 1, 1876, was a native of Bristol, England, and a graduate of the Bristol Medical School. Coming to America with his young wife in 1847, he settled in Cincinnati, and, after practising medicine for some years in that city, entered the Army as surgeon of volunteers at the outbreak of the Civil War, in which his service was distinguished, and afterwards made his mark as one of the collaborators of the *Anthropometric Statistics* published by the Provost Marshal's Bureau of the War Department, to which compilation he contributed a treatise on anthropometry. Dr. Fletcher was a true scholar, especially learned in the classics and the older English literature, and, during his long life, he made many valuable contributions to anthropology and the history of medicine. He was a man not unlike Billings in character—forceful, reliable, honourable—but of a different cast of mind. Billings was essentially the man of action who delights in doing things of immediate practical moment. Fletcher's was the spirit that loves to browse and delve in the lore of the past, although, up to his ninetieth year, he took the keenest interest in all advances in medical science. Both were well-trained physicians and surgeons, both were of the same race, both had the same literary and social tastes. Thus the two men were admirably adapted to do effective team work, indeed, as Professor Welch once remarked, they worked beautifully together.

From 1876 on, Billings and Fletcher worked steadily at preparing the copy of the prospective *Index Catalogue* for a period of four years, until, partly through the good offices of Dr. Abraham Jacobi, Congress at length made the appropriation for printing it in 1880. The matter of typography and general arrangement of the contents

having been settled in the *Specimen Fasciculus*, the main question was that of classification. Following the general idea of a subject and author catalogue arranged in dictionary order in a single alphabet, the special subjects being featured by means of key titles or rubrics in heavy black type, it was found that, after settling upon the main grand divisions, such as, Aneurism, Cancer, Fever (Typhoid), Labour, Tumors, etc., and subdividing these, the subjects of lesser weight easily fell into their place through the simple device of finding the centre of gravity of the title in each case. At the start, Dr. Billings saw clearly that he could not prepare a complete bibliography of his subject but rather a bibliographical conspectus of the contents of a great library, happily to all intents and purposes so complete that it became, for practical use, a working bibliography of medicine. Furthermore, as modern medical science was even then beginning to advance by leaps and bounds, its surface aspects constantly changing as it advanced, he saw at once that it would be impossible to adopt any arbitrary and fixed classification, based upon a definite scheme of nosology, since any such scheme would be, like the average medical text-book of to-day, obsolete in a few years. The flexible plan of classification which Billings adopted suggests Matthew Arnold's comparison of American institutions to a suit of clothes which fits the wearer well but is so put together that it is continuously adaptable to changes in growth and girth. Dr. Fletcher, after an experience of many years, likened the *Index Catalogue* to a vast metropolitan hotel[1] containing story after story of rooms and suites of rooms of all sizes and prices, adapted to tenants of every degree of income and worldly place. In such a caravansary, some subjects like Labour, Surgery, Water Supply, etc., are old wealthy patrons having a per-

[1] In a conversation with the writer.

manent claim upon apartments of vast extent, occupying an entire floor. Others, such as Acupuncture, Amulets, Animism are on such a slender financial footing that they must put up with hall bed-rooms or be "cabined, cribbed, confined" in the attic. Others, such as Arteriosclerosis, Bacteriology, Parasitology, Pellagra, Poliomyelitis, were once poor and needy but, having come up in the world, acquire extensive suites, with rooms perchance for even maid or courier. Others, such as many modern drugs, diagnostic tests, and surgical procedures, are bounders and get-rich-quick parvenus, who exhaust their substance in vain and vulgar show, fading away as soon as their credit is gone. This comparison of Dr. Fletcher's gives a picturesque inside view of the *Index Catalogue.* As the plan of the First Series was complex, so was its execution remarkable for simplicity and economy of means. Liberal appropriations from Congress afforded opportunities for purchasing, not only the greater classics of medicine, and its modern monographs, but all the important medical periodicals of the world that were purchasable. When the bound files of the latter began to arrive in the early days, Dr. Billings, with characteristic energy, set about the task of checking their contents for indexing, occupying even his private leisure with this work. Almost every day, a government van would leave a wagon load of bound periodicals at his residence in Georgetown and the next morning would find their principal articles, cases, and essays carefully checked, by lead-pencil markings, for the copyists in the office. This night work continued until the gigantic task of indexing all the bound periodicals was accomplished, but even in the later days, when he had only the current unbound periodicals to deal with, Billings still continued to take some of these home in his overcoat pocket, or to have them sent up in baskets, for checking. Meanwhile, the daily office routine was taken up in in-

structing the employees in the library tasks of indexing cards, classifying the subject and author catalogues, and preparing copy for the printer. When Billings took charge of the Surgeon-General's Library, Government employees were not appointed by competitive civil service examinations, but were simply pitchforked into the service through political preferment or as a recognition of their services in the Civil War. Most of the employees whom Billings selected for this work came from the latter class, being old hospital stewards, one or two of whom had served with Billings in the field. With the exception of Mr. Edward Shaw, a Yale graduate, none of these men were educated beyond common schooling, but as old soldiers they had the dependability and reliability upon which Billings set the highest value. Given reliability, he reasoned, and I can, by intensive training, convert it into efficiency. The correctness of his theory may be judged by its results. Like Emerson's cook who, by dint of cooking the same dinner over and over again, eventually attained perfection, so these old employees, none of them linguists, soon learned the rudimentary technique of medical bibliography and by the publication of the first volume of the catalogue, were already working at its details with reasonable proficiency. Apart from Dr. Fletcher and himself, the only linguists Billings had were a few industrious Germans of fair education.

In 1880, the first volume of the *Index Catalogue*, a massive quarto of 888 pages, covering the literature from A to Berlinski was published. In the preface, Dr. Billings makes due acknowledgment of

> the valuable assistance which I have received from Dr. Robert Fletcher in carrying this volume through the press, assistance which has gone far beyond mere routine or the limits of office hours, and without which I should have found it impos-

sible to have done the work, and to have performed my other official duties;

and he makes similar acknowledgments to the help rendered by Drs. Henry C. Yarrow and Charles Rice, who were also engaged upon the work at this time. Upon its publication, the *Catalogue* was gradually sent out to universities, laboratories, medical and public libraries, boards of health, and to physicians specially interested in scientific medicine or in medical literature as such. Its reception by the medical profession and the organs of opinion in Europe and America was flattering in the highest degree; and there is no doubt that the appearance of this epoch-making work, in connection with the reputation already established by Billings as designer of the Johns Hopkins Hospital, led the committee of the International Medical Congress to ask him to make one of the principal addresses at its meeting in London in 1881. The appearance of the *Index Catalogue* marked an epoch in the development and improvement of medical literature, particularly in the United States. Editors of medical journals, chiefs of clinics and laboratories, and physicians writing upon all branches of medicine, who formerly had to obtain historical, statistical, and other data in the most haphazard way, now had their materials ready to hand in the most convenient and accessible form possible, that is, the strictly alphabetical.

An index catalogue [says General Woodhull,] is not a muster roll, it is not a mere list, like Homer's *Catalogue of the Ships*. It is as though the contents of the ships are itemized and so scheduled that every article and its uses are invoiced in such a way that everything aboard the fleet may be accessible without confusion or delay. There must be technical knowledge, infallible arrangement and unceasing industry.[1]

[1] Woodhull, *J. Mil. Serv. Inst. U. S.*, Governor's Island, N. Y. H., 1913, liii., 328–342.

In short, although Billings did not regard the *Index Catalogue* as a strictly scientific production, yet none the less it had and has the definite labour-saving intention avowed in all scientific procedure, to economize effort and prevent the dissipation of energy. In this regard, we need only compare it with those systems of bibliography in which titles are to be located by definite and arbitrarily affixed numerals, as in the Dewey system; or with those in which each title is tucked away in some minute subdivision determined by a strictly scientific classification, as in the admirable *International Catalogue of Scientific Literature* published by the Royal Society. In each of these classifications, a complex mental operation is necessary, not only for the classifier to put the title in the right place in the first instance, but for the anxious inquirer to find it after it has been so placed. The writer has had some slight experience with these modes of classification and while they are most interesting and instructive to work with, to find something wanted in them on the spur of the moment seems not unlike the difficulties encountered by those learning to play the French horn: the player must first purse his lips to form a correct *embouchure*, he must read the notes on the staff and transpose them from the arbitrary clef into the proper key, and, having done this, he must, by the combined action of his mind and his lungs, give the right pitch, volume, and dynamic effect to these notes, or the results will be disastrous. In regard to the difficulties experienced by those attempting to find things placed in a numerical rather than an alphabetical classification, we may recall the instance of the poet who claimed that there were only two copies of his work in existence; one was irrecoverably lost, the other was concealed under a wrong entry in the Library of the British Museum. In the cataloguing of subjects, it is true that the larger secular libraries, such as those of London, Washing-

ton, and New York, which take all knowledge for their province, have found it best to issue such catalogues in the form of special bulletins; but one of the best general subject-author catalogues for working purposes is that of the Peabody Library in Baltimore, which follows the *Index Catalogue* in arrangement and mode of classification, while adhering to the British Museum idea of tagging individual books with special (plus or minus) numbers, which locate their place in the alcoves. A certain eminent physician once cynically defined the *Index Catalogue* as a repository of "clerk's work"; and this, in a sense, it is, since even in laboratory investigations, "bundles and files of facts are not science." In the same sense, the Pyramids and the great cathedrals of the Middle Ages were the work of ordinary masons and stone cutters, but even as these stupendous structures glimpse the master architect behind them, so under the firm guiding hand of Billings, the first sixteen volumes of the *Index Catalogue* were slowly evolved year by year, forming, in the end, a definite world-record of the scientific endeavour of physicians in all ages and a permanent monument to his memory. No one has ever given to secular history or to physical science what Billings has given to medicine and the medical historian.

One year before the publication of the first volume of the *Index Catalogue*, Dr. Billings and Dr. Fletcher hit upon another bibliographical expedient, the design of which was to give physicians a classified record of the current medical literature of the world, month by month. This was the *Index Medicus*, the editorial management of which was principally in the hands of Dr. Fletcher. The first monthly number of this publication was issued on January 31, 1879. It consists of a handsomely printed fasciculus, giving the medical literature of the preceding month carefully arranged as to subject-rubrics. The classification, as covering a smaller body of material, is

more general and less subdivided than that of the *Index Catalogue*, the scheme of nomenclature and nosology being, as the editors state, essentially that adopted by the Royal College of Physicians of London, "based upon Dr. Farr's well-known system." In the preface, physicians are urged to subscribe promptly to the *Index*, and to forward to the editors a copy of every book, pamphlet, or other production which they may regard as worthy of being included in it. "If these suggestions are complied with," Billings adds, "I feel sure that all parties will be satisfied with the results, which may expand beyond anything now promised." In connexion with the classification, he goes on to say that in medical bibliography, "nosology must hold a subordinate place, because medical writers do not adhere to a uniform system of classification." In the first volume of the *Index Medicus*, a special page of medical "Notes and Queries" is included at the end of each number, consisting of questions and answers bearing upon rare books and editions, and other recondite things in medical bibliography and history. A running fire of these was kept up for about a year, the principal contributors being Billings, Fletcher, and Mr. Thomas Windsor, but the clever idea not receiving the interest and support from the profession which it deserved, it was discontinued. To the first volume also, Billings contributed a special bibliography of the literature of public hygiene. When the twelve monthly numbers for the year 1879 were complete, an annual author and subject index of the whole material was prepared, the subject index being minutely subdivided, forming, in respect of classification, a sort of annual Index Catalogue *en miniature*. In spite of the great help which it held out to the medical profession, the *Index Medicus* has never had many subscribers and its fortunes have been varied. The first series ran through twenty-one volumes, which had their ups and downs. In 1884,

the original publisher, Mr. F. Leypoldt of New York, died, and the hazards of the venture were undertaken by Mr. George S. Davis, of Detroit. He too succumbed to the inevitable, failing in 1894, after which Dr. Fletcher himself undertook the business management as well as the editorial supervision, with Messrs. Rockwell and Churchill of Boston as publishers, the price of the publication having been raised to twenty-five dollars. Under this new arrangement, the journal ran through four volumes (1894–98), but had to be finally discontinued on account of lack of financial support. An attempt to revive the *Index Medicus* was made by MM. Charles Richet and Marcel Baudouin in Paris, running through three volumes. The *Index Medicus* was ultimately revived and permanently put upon its feet under the patronage of the Carnegie Institution of Washington in 1903, with Dr. Fletcher as editor-in-chief. It is still current.

Early in the year 1881, Dr. Billings received a cablegram, of date January 14th, from Sir William Macormac reading, "Committee invites you to give general address to Congress." This referred to the International Medical Congress which was to meet in London during the coming summer. To this cablegram Dr. Billings, after due deliberation, replied on the following day, "Honour appreciated and accepted." The "honour" was, in fact, a distinguished one and had not been conferred upon any American physician before this period. On February 28, 1881, he received an equally flattering proposal from Sir John Simon to take a leading part in the proceedings in the section on state medicine on the first day of its meetings. In due course, Dr. Billings received, "by command of General Sherman," the usual order from the Adjutant-General (R. C. Drum) directing him to proceed to London in August as a delegate to the Congress, with further instructions to visit "in the interests of the Medical

Department, such points in Holland, Belgium, Germany and elsewhere, as may be deemed necessary by the Surgeon-General of the Army." The order of the Surgeon-General (Joseph K. Barnes), of date June 8th, further directed him to confer with the agents of the Surgeon-General's Office in London, Paris, Amsterdam, and Leipzig in regard to the system of exchanges between the office and European institutions; to secure such exchanges, wherever possible, especially with university libraries and medical schools; to examine into "the most recent and best specimens of hospital construction, and also of museum and library buildings, in England, France and Germany"; and to make special inquiry into the methods of obtaining and compiling vital statistics in England, Belgium, France, Germany, Switzerland, Austria, Holland, and Italy, in order to furnish the National Board of Health with information upon this subject. The precise order in which these instructions were to be carried out was left to the discretion of Dr. Billings himself, and he was directed to return not later than November 20th. On June 20th, he sailed on S. S. *Scythia*, arriving at Liverpool on July 4th. A few extracts from his letters follow:

June 23, 1881. On board Steamship *Scythia*. We are now about three hundred miles from New York, with the sea as smooth as a pond, a bright sun and a very faint breeze. . . . I have made several pleasant acquaintances and find one or two doctors on board whom I know very well—among others Dr. Austin Flint, senior, of New York. . . . Dr. Ring, the ship's surgeon, was surgeon of the *Batavia* when I went over in 1876.

June 25. I had a long talk this morning with Rev. John Hall, the pastor of the Fifth Avenue Presbyterian Church of New York, a big Irishman with a correspondingly big heart.

June 26. Whist last night with Drs. Harrison and McEwen and Mr. Duncan, Dr. Flint of N. Y. joining. They all took Welsh rabbit about 10 P.M., but I was wiser, and find that this morning I am much happier than they are.

July 1. (Friday) We shall reach Liverpool Sunday morning.

July 4. Liverpool. The news from Garfield is less favourable this afternoon and I fear there is trouble ahead. I have been running around all day and feel quite tired, but must go and dress for dinner with Dr. Braidwood. I go to London to-night, and meet Mr. King there to-morrow.

July 12. Brussels. We are at the Hotel Mengelles, on the Rue Royale, a fine hotel, and from the little I have seen of it, I think this is a beautiful city. . . . During the Congress in London, I am going to stay with Dr. Ord, who is the Dean of St. Thomas's Medical School and the Secretary of the Nomenclature Committee of the Royal College of Physicians. On Tuesday, August 2, I dine with Mr. John Simon, the Chairman of the Section of State Medicine, on the 3rd, with Sir William Gull to meet the Prince of Wales, on the 4th, with the Lord Mayor, on the 5th, with Mr. Erichsen, on the 6th, with the Hospital Club, on the 7th, with Mr. Lister, etc. You see my time is pretty well filled up. On Sunday last, I went with Dr. Brunton out to Mrs. Craik's (*née* Muloch, author of *John Halifax*, etc.). It is a beautiful place, and crammed full of beautiful things, among which a sketch by Turner pleased me most. Mrs. Craik I did not see as she was away. I am to meet her on my return. . . . A string of milk women in wooden shoes has just gone by. Each one has a little cart drawn by a big dog, and the whole arrangement is decidedly something new. . . . I see the President continues to improve. If he recovers it will be a lucky shot.

July 17. Heidelberg. My dear little Maggie. Your letter was the first one I had got from home since I came away, and

I was very glad to hear of your garden party, and that you are having such a good time. I find that the little girls here look a good deal like the little girls in Georgetown. They all seem to have eyes and teeth and hair, and the only curious thing about them is that they all talk German surprisingly well. One of them came up to me this morning and said: "*Guten Morgen, mein Herr, Wollen Sie mir nicht einen Pfennig geben?*" And I said: "Thank you, but I believe I don't want any." I can't write you a long letter this time. . . . I am going to walk up on a mountain behind the hotel to see an old castle. So good-bye.

July 21. Hôtel des Trois Rois, Bâle, Switzerland. We left Heidelberg on Tuesday morning and went to Strasbourg. There for the first time I saw storks and their nests on the chimneys of the houses. The Strasbourg Cathedral is the most beautiful one I have seen. It has a large rose window at one end filled with old stained glass just like a spider's web woven in stone and gems. The famous clock went through its performance for us, and the skelcton struck four in a most impressive manner. From Strasbourg we went yesterday morning to Freiburg, which stands on the edge of the Black Forest. There we saw the University, and the Cathedral and got a German dinner which was entirely too much for Mr. King and came near driving me out of the room. Last night we came here. It is now 7:30 A. M. and I am sitting by a window in the fourth story of the hotel, out of which as I look I can see the hills of the Black Forest in the distance. The hotel stands on the edge of the Rhine and immediately under my window are three or four boys fishing. It is all very beautiful, but the intense heat prevents enjoyment.

July 24. Hôtel Beau Rivage, Geneva. Got here yesterday afternoon. . . . Mr. King has been sick for two or three days, and travelling with him is like having a piece of very delicate china under one's charge. He is, however, a very pleasant travelling companion, and it is very fortunate for me that I have been able to make this trip with him. . . . We shall

make a little excursion on the Lake to-morrow, and the next day leave for Paris. I had a beautiful view of Mont Blanc from here last evening at sunset. It looked like a faint rose-coloured cloud in the distance.

July 31. Oxford. I am spending this Sunday at Dr. Acland's in preparation for the hard week's work which is just before me. . . . I am in the Library which is a sort of beau ideal of a library. There is hardly room to walk through it, it is crammed so full of extra cases, carved chairs, etc. . . . As yet I have not been able to make any plans as to what I shall do after the Congress. I have received an invitation from the President-elect of the British Medical Association to stay with him at the Isle of Wight, during the meeting of the Association there, and I shall probably accept for two or three days. August 1, 7 A.M. Yesterday afternoon it cleared up and I had a lovely drive with Dr. Acland to a little village called Thame, fourteen miles from here. It was a typical English rural scene that we went through and a typical little English village, remote from the usual lines of travel, that we went to. On the way back, we stopped at the place of a typical old-fashioned English squire's—a Mr. Ashhurst—where I saw the most beautiful lawn and garden that I have ever seen. . . . Leave for London at nine to-day. I am to dine with a club of Edinburgh graduates.

London, August 9, 1881. The Congress will finish to-day and I am not sorry. I have had a splendid time, having been given the seat of honour and having had the utmost courtesy and hospitality shown me everywhere. My address was a great success. The audience actually rose at me when it was done, and shouted and cheered until they were hoarse. Sir James Paget, the President of the Congress, rose and said that if the Congress had done nothing else but produce that address it would have been worth while to have held it. You see how my good luck continues, good luck which I always say dates from the time I met you. . . . The Congress is entirely over and I leave this morning for Ryde in the Isle of Wight, where

I am to be the guest of the President of the British Medical Association.

On August 5th, Dr. Billings delivered his address before the International Medical Congress on "Our Medical Literature," a discourse which made a deep impression by reason of its unusual display of wit and wisdom. He begins with a modest reference to the embarrassment occasioned by so great an honour and the natural choice of a subject with which his library work had made him familiar. By "Our Medical Literature" he means not the literature of any particular country or nation, but "the literature which forms the intra- and international bond of the medical profession of all civilized countries; and by virtue of which we, who have come here from the far West and farther East, do not now meet, for the first time, as strangers, but as friends." After reminding his audience that about one-thirtieth of the mass of the world's literature is medical, comprising a little over 120,000 volumes and about twice that number of pamphlets, increasing at the rate of about 1500 volumes and 2500 pamphlets annually, he proceeds, by his favourite statistical method, to give a number of kaleidoscopic views of the rate of production in countries and from various angles, pointing out that the number of physicians who write was (at that time) least in the United States and greatest in France (on account of the large number of French graduating theses); that, exclusive of the inaugural dissertations, France, Germany, and the United States lead in the production of books and pamphlets.[1] In periodical literature, the order is, United States, Germany, France, although Germany actually produces the greatest bulk of periodical literature because the individual monographs

[1] In 1912, the order was Germany, Italy, France, United States, (*Paris méd.*, Jan. 31, 1914, Suppl., p. 371).

and articles are much longer. Germany also leads in anatomy, physiology, and pathology, France and the United States in practical (internal) medicine. These figures, he says, are not to be taken literally, but represent "merely the opinions of an individual":

Be that as it may, I think we can take them as indicating certain differences in the direction of work of the medical authors of the great civilized nations of the earth; but they must be considered as approximations only; and the statistical axiom must be remembered that the results obtained from a large number of facts are applicable to an aggregate of similar facts but not to single cases. There will be a certain number of medical books and papers printed next year, just as there will be a certain number of children born;—and as we can within certain limits predict the number of these births and the proportion of the sexes, or even of monsters;—so we can within certain limits predict the amount and character of literature that is yet to come, the ideas that are yet unborn. . . . Speaking broadly we may say that at present Germany leads in scientific medicine both in quantity and quality of product, and that the rising generation of physicians are learning German physiology. But the seed has gone abroad and scientific work is receiving more and more appreciation everywhere.

Passing to the subject of medical education, he notes that there is widespread dissatisfaction with existing conditions everywhere, but no general agreement as to the remedy:

Solomon's question, "Wherefore is there a price in the hands of a fool to get wisdom, seeing he hath no heart to it?" is now easily answered, for even a fool knows that he must have a semblance of wisdom, and a diploma to imply it, if he is to succeed in the practice of medicine; but to ensure the value of a diploma as a proof of education is the difficulty. The evidence

of discontent and tendency to change is a good sign. In these matters stillness means sleep or death—and the fact that a stream is continually changing its bed shows that its course lies through fertile alluvium and not through sterile lava or granite. I have said that as regards scientific medicine we are at present going to school to Germany. This, however, is not the case with regard to therapeutics, either external or internal, —in regard to which I presume that the physicians of each nation are satisfied as to their own pre-eminence. At all events it is true that, for the treatment of the common diseases, a physician can obtain his most valuable instruction in his own country; among those whom he is to treat. Just as each individual is in some respects peculiar and unique, so that even the arrangement of the minute ridges and furrows at the end of his forefinger differs from that of all other forefingers, and is sufficient to identify him; and as the members of certain families require special care to guard against hæmorrhage, or insanity, or phthisis; so it is with nations and races. The experienced military surgeon knows this well, and in the United States, which is now the great mixing ground, illustrations of race peculiarities are familiar to every practitioner.

Taking up Du Bois Reymond's lament that science is becoming too utilitarian, too materialistic, and is in process of being destroyed by the very industries to which it gives rise, a tendency which the distinguished physiologist blames, as usual, upon the United States, Billings considers the burthen of his plaint as follows:

It has become the custom to characterize as "Americanization" the dreaded permeation of European civilization by realism. If this characterization be correct it would seem that Europe is pretty thoroughly Americanized as regards attention to material interests and appreciation of practical results. But the truth of the picture seems to me doubtful. Science is becoming popular, even fashionable, and some of its would-be votaries rival the devotees of modern Æstheticism in their

dislike and fear of the sunlight of comprehensibility and common sense. The languid scientific swell who thinks it bad style to be practical, who takes no interest in anything but pure science, and makes it a point to refrain from any investigations which might lead to useful results lest he might be confounded with mere "practical men" or "inventors," exists and has his admirers. We have such in medicine, and their number will increase.

Taking up now the actual relation of his subject to the advancement of the science and art of medicine, he first notes the dangers of separating physiology proper from internal medicine and pathology, since in the ward and the dead-house, Nature is always the best vivisector; yet, curiously enough, he challenges Michael Foster's view that physiology and pathology can no more be separated than meteorology can be divided into sciences of good and bad weather, and insists that the artificial production and reproduction of disease in the laboratory cannot keep pace with the knowledge to be gained by observation of the sick themselves. Yet experimental pathology had been founded by Claude Bernard, Frerichs, and Traube long before Billings wrote; Koch himself was introducing his most telling innovation in bacteriology at the Congress at which Billings spoke, and the rapid advances since made in this branch of scientific medicine need only be referred to. While pointing out the evils of specialism, when not based on a broad foundation, he does not gainsay its advantages:

> The tool must have an edge if it is to cut. It is by the labour of specialists that many of the new channels for thought and research have been opened, and if the flood has sometimes seemed to spread too far, and to lose itself in shallow and sandy places, it has nevertheless tended to fertilize them in the end. The specialists are not only making the principal advances in science but they are furnishing both strong incentives and

valuable assistance towards the collection and preservation of medical literature and the formation of large public libraries.

As an indication of the increase in number of medical libraries, public and private, he says that "if the entire medical literature of the world, with the exception of that which is collected in the United States, were to be now destroyed, nearly all of it that is valuable could be reproduced without difficulty." Yet, in spite of the astounding increase in medical literature, he holds that the rate of increase is becoming smaller, that it will remain constant in Western Europe, but will increase in America, Russia, and Southern Asia. The amount of "effete and worthless material" in medical literature is constantly increasing, although everything of value in the modern period can be found in the publications of the last twenty years. For this reason, the busy practitioner need only dip into the greater classics, since the net result of their contents has also been absorbed in the text-books. "If, perchance, among the dusty folios there are stray golden grains yet ungleaned, remember that just in front are whole fields waiting the reaper." Hence it is cheaper and more expedient to have bibliographical work done than to do it, yet it is an essential part of the working physician's equipment to know how it should be done:

> Upon the title-page of the Washington City Directory is printed the following aphorism, "To find a name you must know how to spell it." This has a very extensive application in medical bibliography. To find accounts of cases similar to your own rare case you must know what your own case is.

The *Index Catalogue* gives, he says, most of the references of special value, and if these cannot be found in some large collection other than the Washington library and if they are not specially featured in the best works on a

given subject, he offers the shrewd advice that it is safe to ignore them as mediocre and negligible. In this way, the student will not be "wasting his time and energy in turning over chaff which has long ago been pretty thoroughly threshed and winnowed." Hence, in English and American schools, the history of medicine would best be cultivated as a means of teaching students how to think and how to use the tools of their profession:

> For books are properly compared to tools of which the index is the handle. Such instruction should be given in a library just as chemistry should be taught in a laboratory. The way to learn history and bibliography is to make them—the best work of the instructor is to show his students how to make them.

Again, "all is not bibliography which pretends to be such":

> Very many of the exhaustive and exhausting lists of references which are now so common in medical journal articles have been taken largely at second hand, and thereby originate or perpetuate errors. It is well to avoid false pride in this matter. To overlook a reference is by no means discreditable,—but a wrong reference, or an unwitting reference to the same thing twice, gives a strong presumption of carelessness and second-hand work. Journal articles, however, and especially reports of cases, undergo strange transmogrifications sometimes, and I have watched this with interest in the case of a French or German paper, translated and condensed in the London *Record*, then appearing in abstract under the name of the translator in a leading journal, then translated again, with a few new circumstances, in a continental periodical, and finally perhaps reversed and appearing as an original contribution in the pages of the *Little Peddlington Medical Universe.*

Hence medical bibliography, as Helmholtz said, "hardly deserves the name of science, since it neither enables us to

see the complete connection nor to predict the result under new conditions yet untried." The practitioner will be mainly concerned with what Dr. Holmes calls "the live literature of his profession," yet even here scientific medicine differs from the exact sciences in that its records are frequently defective:

> This defect in the records is largely due—first, to ignorance on the part of observers; second, to the want of proper means for precisely recording the phenomena; and third, to the confused and faulty condition of our nomenclature and nosological classification.

The first and main difficulty is that many observers cannot accurately describe what is directly in front of them:

> Just as it took thousands of years to produce a man who could see what now any one can see when shown him, that the star Alpha in Capricorn is really two separate stars, so we had to wait long before the man came who could see the difference between measles and scarlatina, and still longer for the one who could distinguish between typhus and typhoid. Said Plato, "He shall be as a god to me, who can rightly divide and define." Men who have this faculty—the "*Blick*" of the Germans—we cannot produce directly by any system of education; they come we know not when or why, "forming a small band, a mere understanding of whose thoughts and works is a test of our highest powers. A single English dramatist, and a single English mathematician have probably equalled in scope and excellence of original work in their several fields all the like labours of their countrymen put together."

The second difficulty—lack of proper instruments of precision for recording the minutiæ of clinical phenomena—was already becoming negligible at the time of Billings's address, and although he says it behooves us to be modest

in this regard, he indulges in a singularly lucky prediction as to the possibility of obtaining telegrams and phonograms from the heart, which was made accomplished fact by Waller, Einthoven, and others about 1889–1903:

The word-pictures of disease traced by Hippocrates and Sydenham, or even those of Graves and Trousseau, interesting and valuable as they are, are not comparable with the records upon which the skilled clinical teacher of the present day relies. Yet how imperfect in many cases are even the best of these records as compared with what might be given with the resources which we have at our command. The temperature chart has done away with the errors which necessarily follow attempts to compare the memory of sensations perceived last week with the sensations of to-day—and the balance and the burette enable us to estimate with some approach to precision the tissue changes of our patients by the records of change in the excretions which they furnish; but we must still trust to our memory, or to the imperfect descriptions of what others remember, when we attempt to compare the results obtained on successive days by auscultation or percussion, although the phonograph and microphone strongly hint to us the possibility of either accurately reproducing the sounds of yesterday, or of translating them into visible signs, perhaps something like the dot and dash record of the telegraph code, which could then be given to the press, and so compared with each other by readers at the Antipodes.

As to the third difficulty, confused and defective terminology, Billings, the experienced librarian and bibliographer, is in his proper element:

"Science" [said Condillac,] "is a language well made," and though this is far from being the whole truth, it is an important part of it. In examining medical reports and statistics, it is necessary to bear constantly in mind that to understand many terms you must know what the individual writer means by them. When, for example, we find in such statistics a certain

number of deaths attributed to gastro-enteritis, or croup, or scrofula, we have to take into account the country, the period and the individual author in order to get even a fair presumption as to what is meant.

The editors of transactions of societies, whether these are sent to journals, or published in separate form, often commit numerous sins of omission in the matter of titles. The rule should be that every article which is worth printing is worth a distinct title, which should be as concise as a telegram, and be printed in a special type. If the author does not furnish such a title it is the editor's business to make it, and he should not be satisfied with such headings as "Clinical Cases," "Difficult Labour," "A Remarkable Tumour," "Case of Wound, with Remarks." The four rules for the preparation of an article for a journal will then be: 1. Have something to say; 2. Say it; 3. Stop as soon as you have said it; 4. Give the paper a proper title.

In every country there are writers and speakers whose statements are received with very great distrust by those best acquainted with them. Supposing these statements to be true, the papers would be of much interest and importance; but the editor should remember that a certain number of readers, and especially those in foreign countries, have no clue to the character of the author, beyond the fact that they find his works in good company. In medical literature, as in other departments, we find books and papers from men who are either constitutionally incapable of telling the simple literal truth as to their observations and experiments, although they may not write with fixed intention to deceive, or from men who seek to advertise themselves by deliberate falsehoods as to the results of their practice. Such men are usually appreciated at their true value in their immediate neighbourhood, and find it necessary to send their communications to distant journals and societies in order to secure publication.

I presume that you are all familiar with the peculiar feeling of distrust which is roused by too complete an explanation. The report of a case in which every symptom observed, and the effect of every remedy given is fully accounted for, and in

which no residual unexplained phenomena appear, is usually suspicious, for it implies either superficial observation, or suppression, or distortion of some of the facts. A diagrammatic representation is usually much plainer than a good photograph, but also of much less value as a basis for further work.

In days of old, when the profession of medicine, or of a single medical specialty was an inheritance in certain families, a large part of their knowledge, and the efficiency of their remedies was thought to depend upon these being kept a profound mystery. Among the precepts of magic there was no more significant one than that which declared that the communication of the formula destroyed its power, and that hence attempts to reveal the secret must always fail. We have changed all that. Every physician hastens to publish his discoveries and special knowledge, and a good many do the same by that which is not special, or which is not knowledge. For the individual, in a degree—for the nation or the race in a much greater degree—the literature produced is the most enduring memorial.

And thus in our great medical libraries each of the folios or quaint little black-letter pamphlets which mark the first two centuries of printing, or of the cheap and dirty volumes of more modern days with their scrofulous paper and abominable typography, represents to a great extent the life of one of our profession and the fruit of his labours, and it is by the fruits that we know him.

At the conclusion of this address, the best that Billings ever made, Sir James Paget spoke as follows:

I am sure I should express the feelings of you all, if I were to say that if this single paper were the sole production of the Congress it was worth coming here to meet that it might be produced. We have all known Dr. Billings as a great leading bibliophilist, but I believe there have been very few who have known heretofore that he does in person absolutely belie the ordinary character given of the bibliophilist; which usually is, first, that such a man is a lover of books; then, that he is not a man of science; then, not a man of practical good sense; then,

not a man of wit. It would be very happy if upon some future day we could hear the whole subject of bibliography treated in so admirable a scientific spirit; not as indicating in books the places in which to find printed knowledge, but to show how, out of books, the contemporary history of man himself might be studied. I can feel that, at the time when I lived by my pen, my income might have been many times larger than it was if I had had the good guidance of Dr. Billings, to know how, and when, and in what method, to work at books. All may now learn from him, and may see, besides, how much real learning may be advanced by the exercise of common sense on all matters of bibliography and medical science; and how much even learning may be graced by the flowing humour, the true good sense, with which he has made every word to sparkle. I propose that we once more give hearty thanks to Dr. Billings for his address.

At the Congress at which this address was delivered, Dr. Billings participated also in the sections on state medicine and on military medicine. In the former, he read a paper on "The Experience of the United States in Recent Years with Regard to Asiatic Cholera and Yellow Fever." In this, he describes the methods then employed in quarantining these diseases, and contrasts the view of La Roche (accepted by the National Quarantine Conventions of 1859 and 1860) that yellow fever epidemics are of local origin, not spread by the sick and not preventable by quarantine, with the conclusions adopted in 1878 that "the cause of yellow fever is specific, particulate, and endowed with the vital properties of growth and reproduction . . . that yellow fever patients are the most frequent cause of the spread of the disease," even though some victims may not transmit yellow fever. A few sentences lower, he says: "Yellow fever is not inoculable nor personally contagious, but is portable and communicable; . . . in Havana, it is not the soldiers but the sailors who suffer

most." After discussing the question of immunity, he gives a full account of American experiences with quarantine and a searching criticism of the conclusions reached by the International Sanitary Conference at Washington in January, 1881. In discussing Dr. Acland's paper on international recognition of medical diplomas, Dr. Billings said that the United States could never become a party to such international agreements, because each of the several States had its own regulations for admission to the right to practise, some States had no such regulations, and, in any case, no individual State has the right to make a treaty with a foreign country. Reciprocity would therefore have very little to do with the matter. Diplomas recognized by the English state authorities might be accepted in the United States without making it incumbent upon England to recognize American diplomas acceptable in certain States of the Union though not in others. The question of registration of physicians in the United States would be bound up with the matter of registration of deaths. In these, the specific cause of death should be in each case assigned by a physician, yet there was no consensus of opinion as to what persons should be defined and recognized as physicians. He illustrates this sad lack of uniformity by pointing out that the necessary criteria were established in Illinois by the State Board of Health, in Alabama by the State Medical Society which also acted as the State Board of Health.

In the section on military medicine, Sir Thomas Longmore paid a very touching and graceful tribute to the memory of one of Dr. Billings's associates in war and official life, Surgeon George A. Otis, United States Army, to which Billings replied in fitting terms. At the conclusion of the Congress, he proposed a general vote of thanks to the Secretary-General, Sir William Macormac, in which parting speech he said:

I was asked this morning what were my impressions as to the permanent good result which would be attained by this Congress, and to that I answered substantially this: Our perceptions of these results are at present dim and confused. It is like the impressions received by those who have been whirled through the green fields and busy towns of old England and "Mother England"—in some of the fifty or sixty miles an hour express trains which pass through this country; and the fields, the fences, and the milestones are at present a little blended together. But they will come out in our memories; all the meetings in sections, the meetings in this great hall, the friendly and social meetings, the little groups of twos or threes or fives all over this great city, will recur to us, and they will come out like the figures in the sensitive plate which has been exposed to the light, upon which the developing solution is poured; and as we pass to our several homes, whether it be in this island, or across the turbulent channel, or over the rolling billows of the Atlantic,—all the scenes of this week, and the talks which at present are so confused and so dim, and so run together that we are hardly prepared to say what we have seen, or what we have done or where we have been—all will come out, and become distinct permanent pictures. Much of the pleasure of these pictures will be due to a single man, and it has been said, over and over again, to this Congress, and to the sections of it, how much its success has depended upon the efforts of this man—the man who has been, as it were, the mainspring inside the complicated machinery, which has been set at work, and kept in order, and kept beating regularly up to time, to produce the results which you have all seen; and for which, I am sure, we are all grateful.[1]

The Congress over, Billings proceeded, *via* Leipzig and Berlin to St. Petersburg and Moscow, after which he returned to Germany over the Scandinavian peninsula, visiting Helsingfors, Stockholm, Copenhagen, and Kiel,

[1] *Tr. Internat. Med. Cong.*, London, 1881, i., 104–105. Dr. Billings did, in fact, give his personal impressions of the London Congress in the *International Review* (January, 1882).

passing southward through Austria to Milan and spending some time in England before his return to the United States. The results of this extended tour appear in his valuable "Notes on Military Medicine in Europe."[1] A few excerpts from his letters follow:

August 18, 1881. Berlin, 9 P.M. I am writing this in one corner of a huge concert hall called the "Berlin Flora" in which about 500 men and women are all sitting around little tables, drinking beer and listening to what are supposed to be comic singers, who pop on and off a little stage on one side like so many jacks-in-the-box. After about fifteen minutes' consideration, I have failed to see any special fun in it, and having a sheet of paper and my stylographic pen in my pocket will begin a note to you, to be finished probably to-morrow morning, before that feeble apology for and semblance of a meal which these benighted people call breakfast.

August 25. St. Petersburg. Arrived here at 6 P.M. to-day rather tired and used up by my forty-three hours' ride. A warm bath, a small dinner and a cup of delicious tea have, however, set me up again. I can't very well go anywhere this evening, for my passport has gone to be registered at the central police office, and until I get it back, which will not be before to-morrow, it would not be judicious for me to be wandering about. . . . So I read a poor novel and thought about home. . . . It is an odd sensation to be in a place where one can neither speak nor read the language, where the names of the streets, the bill of fare at the hotel, the newspapers, everything is in an unknown tongue. I have been talking German in a hit or miss sort of way until I find I can make myself understood after a fashion, and it is very fortunate that it is so, for I have got to rely almost entirely upon German while I am here. I was met at the depot here by a medical officer of the Russian army, Dr. Weljaminow, who had been written to by his Medical Director, Dr. Reyher,

[1] *Jour. Mil. Service Inst.*, Governor's Island, N. Y. H., 1882, iii., 234–247.

whom I met in London. Dr. Weljaminow has orders to show me around and as he speaks only German and Russian, you see that "*Ich muss Deutsch sprechen*," or not speak at all. He is to meet me here to-morrow and take me to the medical libraries and hospitals.

August 27, 3 P.M. All day yesterday, and also this forenoon, I have been going from one hospital and medical library or school to another, until I am pretty tired. Last night I went into a Russian theatre for a little while to hear some Russian and gypsy songs by a troupe who make them a specialty. I now think I shall go to Moscow on the evening of the 29th, return here on the 31st, and go from here to Königsberg, Hamburg and Kiel. The weather has been unfavourable since I have been here, rainy and chilly, but there is abundant vegetation and I saw some very fine oak trees yesterday in a drive upon what are called the Islands.

September 4. Stockholm. 6 P.M. All right. Out of Russia and glad to be out.

September 8, Dresden. I have had a rather rough and not overly comfortable trip through Russia and Sweden, and am glad to have it done. It was, however, very interesting and I have learned a good deal. I have a large and important package of proof from the Census Office, and must go to work on them.

September 18. Munich. This forenoon I have taken a five mile walk about the city, and have also been in the National Museum, which is the finest collection of bric-à-brac in the world, I suppose. . . . Munich is full of art of all kinds, and it is the worst smelling city I have yet been in. The collections of modern pictures by Munich artists pleased me most, and if I had fifty thousand dollars to spare, I could get enough of such pictures as I like to furnish our house very well indeed. . . . Since writing the above, I have taken a little stroll and examined what is called the Kaulbach Museum, being the sketches and unfinished pictures left by that celebrated artist.

It was extremely interesting, but made me feel rather sad. He must have been an unhappy man, certainly with his pencil he was a savagely sarcastic one.

Grand Hôtel de New York, Florence, Italy, September 21, 1881. I arrived here from Bologna at 8:20 P.M., had a cup of tea and then took a walk of about two miles through a wilderness of narrow crooked streets, having no idea of where I was going and caring very little about it.

Hôtel d'Isotta, Genoa, September 24, 1881. I have just had breakfast consisting of coffee and a small omelette. Butter not eatable but supply of toothpicks unlimited and dining-room well frescoed. Had a lovely ride yesterday along the shore of the Mediterranean from Pisa to this place. The Apennines come close to the sea and about half the way the road is tunnelled through the spurs of the mountain chains. I saw the people literally sitting in the shade of their vines and fig trees, and I understand now Ruskin's phrase of "the bars of the cypress." . . . In some respects, this city is stranger than any I have yet been in. The greater number of the streets are mere passages about 6 feet wide, and as the houses are very high, these passages are dark and cool, and on such a day as this, with a blazing sun, are very agreeable to stroll through. The most characteristic locality is perhaps the wharves, where a motley crowd of all nations are gathered. I got the London *Times* this morning containing an account of the President's death.

About this time, honours of various kinds began to crowd in upon Dr. Billings thick and fast. Prior to 1882, he had been made a member of the Academy of Natural Sciences of Philadelphia (1862), the Philosophical Society of Washington (1871), the American Medical Association (1880), the American Public Health Association (1880), and honorary member of the medical societies of the County of New York (1879) and the State of New York

(1880), the Medical and Chirurgical Faculty of Maryland (1880), the Medical Society of London (1881), the Clinical Society of London (1881), and the Society of Medical Officers of Health, London (1881). After this date, his name was enrolled in the membership of a great many other scientific bodies, in particular the National Academy of Sciences (1883), the American Association for the Advancement of Science (1883), the College of Physicians of Philadelphia (1883), the Statistical Society of London (1883), the American Statistical Association (1884), the American Surgical Association (1885), and the American Philosophical Society (1887), not to mention many European and American societies thereafter. In a letter of June 6, 1883, the trustees of the Johns Hopkins University offered him the professorship of hygiene in the medical department, which he declined because it was not possible for him to hold the position and continue his duties as an army officer. In February, 1884, the Senatus Academicus of the University of Edinburgh invited him to receive the honorary degree of Doctor of Laws, at the festival of the tercentenary of the foundation of the University on April 17, 1884. About the beginning of April, we find him sailing for Liverpool again, in company with Dr. Fordyce Barker and his son, to both of whom he was warmly attached. Arriving at Liverpool on Sunday, April 13th, he found a letter from the Lord Provost of Edinburgh, inviting him to be his guest for the week, and he proceeded to the University the following day. The occasion was a great one, crowded with festivities and festal dinners, luncheons, concerts, processionals, sermons, and receptions. Among those receiving honorary degrees were the poets Browning and Lowell, the Master of Balliol (Professor Jowett), Freeman, the historian, Sir Frederick Leighton, Pasteur, the mathematicians Cayley, Sylvester, with Helmholtz and Lord Rayleigh among mathematical

physicists, the chemists Bunsen and Chevreul, Geikie the geologist, and, among medical men, Virchow, Henle, Hyrtl, Pettenkofer, Sir Andrew Clark, Sir William Gull, Sir William Jenner, the elder Gross and Fordyce Barker. Witty and interesting speeches were made by many of these worthies, and, in proposing to the toast "The Architect," no doubt assigned him on account of his connection with Johns Hopkins Hospital, Dr. Billings made the following remarks.

It is now about 135 years since the first American received his degree of Doctor of Medicine at the University of Edinburgh, and Dr. John Moultrie returned to Charleston to fight the yellow fever on the methods and principles which he had here acquired. Sixteen years afterward, four or five graduates of the University of Edinburgh became the first medical faculty in America—the faculty of the University of Pennsylvania—which adopted the organization and the methods of work of this University, their *Alma Mater*. The seed thus sown has multiplied exceedingly. We have now sixty or seventy medical schools, and sixty or seventy thousand doctors with diplomas. Not all of it, perhaps, is good fruit; some of the heads may be chaff, with no grain (laughter). As the representative of the University of Pennsylvania, and as the representative also of the youngest University in the United States—and being specially interested in the subject of the methods of providing for modern medical teaching, I am very glad to have the opportunity of proposing the toast which is set down opposite my name, for I have had the opportunity of examining the buildings which have been constructed for the work of the medical departments of many of the great Universities in Europe and of our own schools, and in this country also. After a careful examination of this building, I am prepared to say that, taking it all together, it is the best planned and best arranged medical school of instruction in the world (Applause.)[1]

[1] *The Weekly Scotsman*, Edinburgh, Saturday, April 19, 1884, p. 7.

In responding to this toast, Mr. R. Rowand Anderson, the architect of the new buildings of the University of Edinburgh, gracefully acknowledged the tribute of Dr. Billings as coming from one competent to speak with the voice of authority.

The Edinburgh festivities over, Billings made no further visits except a short run to London, but returned directly home by the S. S. *Bothnia*, arriving in New York on April 29, 1884.

One relic of his brief London visit survives, a letter from the late Sir Francis Galton, referring to the instrument devised by Major Washington Matthews (U. S. A.) and Billings for making composite photographs of skulls which was described in two memoirs read to the National Academy of Sciences on April 22d and November 12, 1885:

42 Rutland Gate, London S. W.,
November 13, 1884.

Dear Sir: I was most agreeably surprised by receiving your beautiful skull composites yesterday morning, and laid them that very evening before the Anthropological Institute. The negro seems extremely good and testifies to the great similarity of its constituents, just as the European skull does to their diversity. You must have found it difficult, as I did, to arrange so that they should be superimposed with the utmost probable justice. The difficulty with skulls is two-fold greater than with faces—(1) because there are no sharp fiducial lines equivalent to those that may be drawn through the pupils of the eyes, through the mouth, and vertically (in a full face) through the midway point between the two pupils; and (2) because the part of interest is the outside rim and not the inner parts so that any misfit is the more conspicuous. I fancy it might lead to even better results if, after fixing each skull successfully in place, a *very small* additional adjustment were made to bring the real skull in the most exact probable

accordance with a fiducial image. What that image should be, is a question to be answered best by the operator, according to the facilities of his laboratory. Our plan would be to outline the image of the first skull on the focussing glass of the camera (the ground part would have to be on the outside) and adjusting all the others by that. The plate holder would have of course to be closed and withdrawn after each exposure, but in a well-made camera, and with a tension to the tight fit of the plate in the plate-holder by a paper wedge, I don't expect any sensible error would result from their frequent removal and replacement. Another plan would be to photograph through an oblique plate of plane and parallel worked glass on which a "Pepper's ghost" of a fiducial skull could at will be thrown by a strong side illumination to be arranged as most convenient. I always found it well to expend a great deal of trouble to get the most profitable adjustment of the images.

I was very sorry to miss the pleasure of seeing you when you were in town. It so happened that the first day that I heard of your address was that on which you were to leave. It would have been a great pleasure to me to have shown you my various instruments in various states of completeness and gain the advantage of your suggestions and criticisms.

While conducting the gigantic work of the *Index Catalogue*, one huge volume annually, and at the same time looking after the plans of the Johns Hopkins Hospital, Billings was also extremely active during the early eighties and after, in scientific and literary work of the most varied character. He had on hand the Johns Hopkins Hospital, the National Board of Health, the *Index Medicus*, and the vital and medical statistics of the tenth census (1880), in aid of which he had already made some valuable suggestions to the chairman of the Congressional Committee in 1878. In 1883, he delivered the annual address to the Medical and Chirurgical Faculty of Maryland, his subject being "Medical Bibliography," and this discourse has

the same wise and witty flavour as the London address of 1881, to which it forms a pendant. In 1880, he began to publish in the *Plumber* certain "Letters to a Young Architect," which were continued in the *Sanitary Engineer* (1880–81), and subsequently appeared enlarged as a volume of 216 pages entitled *The Principles of Ventilation and Heating* (1884). His introduction to Buck's Treatise on Hygiene (Ziemssen's *Handbuch*), bearing the title "On Causes of Disease and on Jurisprudence of Hygiene" (1879), was the germ of two separate monographs on hygiene which he published in Pepper's *Systems of Medicine* in 1885 and 1893. His work on composite photography of skulls was carried on, with Major Washington Matthews in 1884–85. In 1886, he was asked to deliver the annual address in medicine before the British Medical Association at Brighton, England, by reason of the sudden death of Dr. Austin Flint, who had been selected in the first instance. On March 20, 1886, Dr. W. Withers Moore, the president elect of the Association wrote:

> We feel that Dr. Austin Flint's position should be filled by one of his countrymen and by no one more fittingly than by Dr. Billings. I therefore wish to ask you to take up the mantle of your departed friend and to come over to the old country not merely to delight us with your oratory, but also to show that you warmly reciprocate our brotherly feeling.

For reasons which will appear, the acceptance of this flattering invitation was a matter of some delicacy, and Dr. Billings referred the proposition to a number of his medical intimates, all of whom concurred in urging him to accept the honour as a duty to his profession. He accordingly set sail on S.S. *Adriatic* on July 8th, in company with Drs. Fordyce Barker and James R. Chadwick, arriving in Liverpool on July 17.

TO MRS. BILLINGS

Killerton, Exeter, August 1. Here I am spending Sunday down in the heart of Devon at the country seat of Sir Thomas Acland, one of the most beautiful places that I have ever seen in my life. I have been to the chapel this morning—the family chapel, that is, and have got to go to church again this afternoon. Of course that part of the programme is not specially to my taste, especially when I have to listen to such a very vealy sermon as I heard this morning, but everything else is perfection, including clouted Devonshire cream, the family portraits, a lovely bit of sculpture by Chantrey, magnificent views in every direction, an avenue of beech trees which look like duchesses and countesses, etc. The house is a large rambling mansion at the edge of a lovely park at which a herd of deer appear at intervals. Sir Henry Acland is here and I enclose a sprig of fern which he sends you.

Brighton, August 11. I have just three minutes before starting for a dinner to tell you that I have given my address and that it was most enthusiastically received. The uproar was as great as at the London Congress and the American doctors here are in a state of high jubilation.

The subject of Dr. Billings's address (delivered on August 11th) was "Medicine in the United States, and its Relations to Co-operative Investigation." As this address was construed as matter of offence in some parts of the United States and had to do with a certain *contretemps* in Billings's career, it is worth while to give some account of it. After a dignified reference to the loss sustained by the profession in the death of Dr. Austin Flint he refers to one of his favourite Scotch maxims, "That which you do not know, tell that not to any one," as determining his choice of a subject, in fact narrowing the range of selection to "a small intercept of space of one dimension." The Congress itself implying unity, co-

operation, and solidarity in the advancement of medicine, what subject could be more appropriate than the conditions and future prospect of medicine in the United States? This settled, Billings proceeds to develop at length the theme which forms the *coda* of his survey of American medicine in 1876.

As in painting a picture, it is best to locate and define the shadows first, and deal with the lights afterward, let us begin by considering some of the things that American physicians complain about; in other words, some of their supposed grievances. One of these is that the profession is overcrowded; that there are too many doctors, both *in esse* and *in posse*, and that this is due to too low a standard of education, and to the want of legal restrictions as to the qualifications which shall give a man the right to practise. The feelings of some of our physicians on this subject are in full accord with those of the good old New England deacon who told the village scapegrace seeking admission, that, "he thought the church was about full."

Statistics gathered in 1883 showed that there were "90,410 persons calling themselves physicians" in the United States and Canada: 1 to 1112 of population in Canada, 1 to 589 in the United States. Furthermore, there were 6.6 physicians per 10,000 in New Mexico, 9.2 in South Carolina, 9.7 in North Carolina, as against 29.3 in Colorado or 25.2 in Indiana. "The proportion of physicians is generally lowest in the Southern States lying east of the Mississippi, and highest in those regions where immigration has recently been active." There are more lawyers and fewer clergymen in the United States than in England, or, as Billings generalizes, it seems that "where the lawyers are the most numerous the supply of clergymen is smallest." The proportion of physicians to population is about 1 to 1000 for England and about 1 to

750 for the United States. "We must admit then," he says, "that there is at all events no scarcity of physicians in the United States." As to the next question, whether the standard of education is too low, he produces a shaded map of the United States, showing that malarial fever is most fatally prevalent in the Southern States in the valley of the Mississippi, while the Gulf States are, moreover, in the yellow fever zone. From this he reasons as follows:

As compared with the North and East, much of this malarious region is a thinly settled country, an almost purely agricultural country, and not a rich country. I need hardly tell you that the physician who has received his chief clinical instruction in the office of his preceptor in Vermont or New Hampshire, supplemented by distant glimpses of a few cases in hospital in Boston or New York, will find himself at a loss at first in dealing with the emergencies of daily practice in Arkansas and Mississippi. He will be subjected to influences which at times are dangerous to one who is not acclimated, and which tend to produce depression of spirits, want of energy and bad health. He will not have free and constant access to scientific companionship, nor be stimulated by the influence of learned societies, and he cannot avail himself of the ordinary sources of amusement, education, and rest, such as art galleries, the drama, libraries, and museums, etc., which are found in the large cities. Moreover, the pecuniary reward which the practitioner in many of these places can reasonably hope for is comparatively small.

Taking all these things into consideration, it is clear that if a man after spending from six to eight years, and from one to two thousand pounds in acquiring such a general and professional education as it is now considered that a skilled physician should possess, then settles in such a region with the prospect of an average income of from £150 to £200 per year, it is not from pecuniary motives alone. There are such men in such places, men who are not only highly educated and skilled

practitioners but who are also original investigators and thinkers. It was within the limits of this malarial shadow that the foundation of modern gynecology was laid by Marion Sims, of abdominal surgery by McDowell, Battey, and Gross, of an important part of the physiology of the nervous system by Campbell. Nevertheless the rule holds good that malaria and science are antagonistic; the exceptions prove the rule.

This proposition stated, he points out that neither "penal nor restrictive legislation" could induce highly educated physicians to settle in thinly settled localities and (his favourite argument) that any fixed standard of qualifications for practice must necessarily be so low as to be ridiculous. On the other hand, American schools had hitherto avoided standards too high, for the simple reason that few could pass even the necessary preliminary examinations, in other words, such schools would not have the material to work with:

> The proverb that it does not pay to give a $5000 education to a $5 boy is clearly of American origin, and sums up a good deal of experience.
>
> You have nineteen portals of entrance to the profession and have not found it easy to keep them all up to the standard. In America we have over eighty gates, a number of turnstiles and a good deal of the ground is unenclosed common.

The result of this condition is that the medical profession in America includes physicians of all classes, some of the highest degree of education and competence, who make up the majority of writers and teachers and are somewhat indifferent to medical reforms, because quackery does not interfere with their own practice; others who rely more upon experience and common sense than upon book learning and whose antagonism to quacks varies inversely as the degree of their own success, younger men in need of prac-

tice being more naturally indignant about charlatanry and drug-store prescribing; and a few honest men who had given up practice because they were convinced of the inadequacy of their knowledge or of some personal lack of aptitude for their profession; finally the great army of unlicensed practitioners, and a few advertising and travelling quacks. Yet the death-rate of the United States at this time was as low as that of any civilized country except Sweden. "Almost the only matter in which figures seem to demonstrate the importance of superior medical education and skill is in the statistics of deaths due to childbirth and of the results of surgical operations." In medical practice, successful treatment is usually accounted the touchstone of merit, and Billings was too shrewd an observer to resume the maunderings of the New Vienna School, which declared that so long as medicine is an art it will not be a science. From time immemorial, quacks and thaumaturgists have effected "cures" where science has failed, and until the American public have convinced themselves that it is in their interests to suppress quackery, "it is necessary to go slowly and allow such evidence to accumulate." The first step in the direction of uniformity, Billings maintains, would be to secure a proper system of registration of deaths in all the States, which should lead to the next step, viz., government regulation of the status of physicians presuming to make such certificates. After giving a thorough and exhaustive account of the status of medical legislation and medical institutions in the United States, Billings shows that there is no real antagonism between the practitioner and the sanitarian, whose aim seems to be to do away with medical practice. The former will always have plenty to do. To illustrate the value of statistics in controlling the diseases most dangerous to humanity, he draws upon his recent experiences with the tenth census,

and produces a series of shaded maps showing that cancer, scarlatina, and diphtheria are essentially diseases of the Northern States, where the population is mostly white; that a high death-rate from cancer indicates a healthy and long-lived population; and that the racial incidence of consumption and pneumonia is more severe among the negroes than the whites. Racial and personal equation in disease is also of importance to the practitioner:

The old family doctor knows that when a particular disease appears in his neighbourhood, he may expect to see it produce in one family convulsions, in another collapse, and, in a third, little or no danger or inconvenience.

I have spoken to little purpose [he goes on] if I have failed to show you that there is a great deal of human nature in American physicians, and that it is the kind of human nature with which you are tolerably familiar. . . . While we must consider the difficulties in the way of the improvement of the science and art of medicine, difficulties due to ignorance, to indolence, to conflict of interests, and to the eternal fitness of things, the existence of such difficulties is not a matter to be bemoaned and lamented over. These obstacles are the spice of life, the incentives to action, the source of some of the greatest pleasures which it is given to man to experience. . . . On the ethical and sociological side, the matter is summed up in Ruskin's aphorism, that "Fools were made that wise men may take care of them!"

We are in a period of the world's history characterized by material prosperity, by increase of populations, by tendencies to uniformity, to the making of individuals of small account. According to the Swiss philosopher, Alphonse de Candolle, this is to last a thousand years or so, after which the pendulum will swing the other way, and there will follow a long period of diminution and separation of peoples, and of decadence.

Against that decay of nations we know of but one remedy,

and that is increase of knowledge and of wisdom. And this increase must be in our knowledge, in the world's wisdom, and not merely in that of John, or Fritz, or Claude.

Billings's Brighton address excited interest everywhere and was widely reprinted. One of the Viennese medical journals gave a graphic full-length account of the personal appearance and mannerisms of "this reformer and pioneer of medical science in America," his tall figure, his sturdy unrestrained attitude, the head thrown back somewhat and slightly inclined to the left, his quick gestures, and the remarkably lively movements of his lips, "making a striking contrast with the metallic composure of the English speakers."

After a short introductory address by the President, at eleven o'clock Billings mounted the platform in the midst of profound silence. Long before the meeting, Billings's address was the only topic of conversation in certain London circles, so that all who were at the Brighton meeting were in the "Dome" and listened to his words with keen interest.

Yet this address, great as were its merits, was to become the storm centre of a feeling against Billings which had been growing apace among certain members of the American Medical Association. Apart from this, his strictures on the low status of medicine at the South and in the Mississippi Valley, and his theorem that "malaria and science are antagonistic," while impersonal and meant as a joke, had the air of being an expression of sectional prejudice. One Southern editor retorted upon Billings by calling attention to the fact that the city of Washington itself, a recognized "scientific" centre of the country, was located in the then malarial "Potomac Flats." Billings coolly clipped out this paragraph and pasted it in his scrapbook along with notices of a more complimentary charac-

ter. It remains to set forth the circumstances leading to the outburst of professional rancour which was a phase of the imbroglio of the International Medical Congress of 1887.

In 1884, the American Medical Association selected eight of its members, Austin Flint, Billings, Minis Hays, Louis A. Sayre, and others to visit the International Medical Congress at Copenhagen and to propose that the next Congress (1887) should be held in the United States. This invitation was accepted; Washington, D. C., was agreed upon for the next meeting, and the committee, which the Copenhagen Congress adopted as its own, proceeded to discharge its duties in accordance with instructions actually received from the Congress itself. This, however, met with definite opposition at the hands of certain members of the American Medical Association, for the reason that the original committee of eight had added to its number thirty-four other members, mostly Eastern physicians of high repute, which gave umbrage to the South and West. At the New Orleans meeting, May 8, 1884, the report of the original committee was repudiated, and a new committee of thirty-eight was appointed, made up of a member from each state and territory plus a representative each from the Army and Navy. This action was followed by the resignation of all the members of the original committee, with the exception of Flint. At a subsequent meeting in Chicago in June, the new committee appointed by the American Medical Association passed a special resolution maintaining that only those who supported the national code of ethics should become members of the Washington Congress. It was assumed by many that Billings, after the events of 1885, was labouring to prevent the Congress from being a success, and his somewhat injudicious utterances about the South at Brighton added fuel to the flame. His own position is

strongly stated in a dignified letter which he wrote to a Southern friend at the time:

I resigned as quietly as I could and since then I have taken no part in the controversy but have attended to my own work which is more than sufficient to occupy all my time and thoughts. I have not asked nor advised anyone to resign or decline; have not noticed in the *Index Medicus* anything that has been printed by either side, and I have counselled quiet and keeping out of print to all who have asked my opinion. I mention this because I was told last week to my surprise, that many persons suppose that I am actively opposing the present organization, am trying to prevent the Congress from meeting here, am hostile to the American Medical Association, etc., all of which is incorrect. I have no doubt that the Congress will meet here in 1887, and although for some time I greatly feared that the Executive Committee of the Copenhagen Congress would order a meeting in Berlin, since all of them were indignant at what has occurred, I now think that danger is nearly passed.

My own feeling about the matter is simply this. Certain prominent men in New York, well known abroad and in previous Congresses, were given official recognition in the first organization, not because they requested it, for they did not, but because we thought it proper to do so. They were then thrown out in a very unjust and insulting way. Some of these men are personal friends; others I know but slightly or not at all, but I could not accept any place in any organization which treats such men as Jacobi, Weir, Loring, Knapp, Loomis, Agnew, etc., as they have been treated.

If the present Executive Committee will settle matters with these gentlemen so that they will overlook what has passed and come into the Congress, I have no grievance. I have no personal ill-feeling whatever. I do not wish to hold any official position, because I am sure that to do so will injure the work in which I am engaged. I believe the Library and Museum interests to be of more importance to the profession than the Congress, which last will be forgotten ten

years from now, and it requires every moment of my time and all my energy to keep the Library and Museum work up. I will never again repeat the mistake I have made or allow myself to be placed in any official position in any society, congress, or association. Excuse all this egotism. I merely want to show you that I am not to be considered in any plan, but am to be left entirely out and left to act as a high private. My work for the Congress will consist in getting the new Library and Museum building completed and properly arranged by the time it meets.

In reply to a letter from one of the committee-presidents of the Congress proposing that he serve as one of the vice-presidents of the section on military and naval surgery, Billings telegraphed as follows: "I cannot accept any official position in the Congress so long as the injustice which has been done remains uncorrected" (November 18, 1885).

The Ninth International Congress met in Washington in 1887, and some distinguished men were present, but its transactions, as compared with the work of the London Congress of 1881 or the Berlin Congress of 1890, were merely those of an assemblage of respectable mediocrity. It is sufficient to state Billings's course in this matter without defending it. He was a man of proud mind and imperious temper, one not given to brooking insults, very much inclined to have his own way, no doubt, yet willing to settle controversy by compromise if he could have peace with honour. Finding he could have neither in a hostile environment, he simply turned his back.

This unfortunate affair caused the severance of many friendships even unto this day. Dr. Billings, however, speedily dismissed the matter from his mind, and, at the Atlantic City meeting of the American Medical Association on June 7, 1904, seventeen years later, he was able to show that he had forgotten all about it:

LETTER TO MRS. BILLINGS

June 8, 1904. I was well received by the Association, and my little paper[1] was applauded. I met Frank Billings and he promised to come and see me when he is next in New York. I saw Welch, Osler, Jacobi, Fitz and Shattuck. A great many men came up and shook hands. Several said they were glad I had forgotten New Orleans.

In 1887, the Army Medical Museum, which had been planned as to administrative and sanitary arrangements by Billings himself, was completed and opened to the public, the Museum proper and the contents of the Surgeon-General's Library having been moved into it. This building, situated at the corner of Seventh and B streets S. W., Washington, D. C., is a large three-story structure, consisting essentially of the huge library hall, containing the book stacks, and the Museum proper, at opposite (west and east) ends of a hallway on the second floor; with laboratories and office rooms above and below stairs, an anatomical laboratory attached as a north wing, photographic galleries underneath the roof, and storerooms and work-shops in the cellar. The collection in the Museum proper owes its inception to a circular issued by Surgeon-General William A. Hammond on May 21, 1862, in which

as it is proposed to establish in Washington an Army Medical Museum, medical officers are directed diligently to collect and forward to the office of the Surgeon-General all specimens of morbid anatomy, surgical or medical, which may be regarded as valuable; together with projectiles and foreign bodies removed, and such other matters as may prove of interest in the study of military medicine or surgery.

[1] Dr. Billings's paper on "The Carnegie Institution" was read, as part of a symposium on Research Work in the United States, on June 7, 1904, and published in the *Journal of the American Medical Association*, Chicago, 1904, xlii., 1674.

At the end of the year 1862, over a thousand specimens had been collected from the fields of the Civil War, and the catalogue, prepared by Captain Alfred A. Woodhull in 1866, showed that the collection had already increased to 7716 specimens. When the collection was moved into the new fire-proof building in July, 1887, it numbered over 15,000 specimens of normal, comparative, and pathological anatomy, surgical instruments and apparatus, microscopes, medical medals, and the like, with some 10,416 microscopical specimens. At the present time the Museum contains 1233 anatomical specimens, 622 comparative, 12,916 microscopical, 3895 miscellaneous items, and 15,015 photographs.

Its care, growth, and classification have been largely due to the able curatorship of Dr. Daniel S. Lamb. The microscopical work, normal and pathological, was for many years under the management of Dr. William M. Gray. The Army Medical Museum is especially rich in its collection of unique gunshot fractures, mostly from the Civil War, and contains many rare curiosities, such as the successful ligation of the innominate, common carotid, and right vertebral arteries by Dr. A. W. Smyth of New Orleans; but it is in no sense an anatomical museum, nor does it contain any such rich stores of pathological material or anything approaching the physiological series in the Hunterian Museum of the Royal College of Surgeons. This is partly because most of the specimens have been donated by officers of the Army or by practising physicians and surgeons, many of whom would naturally incline to keep things interesting in their own experience for themselves. At best, it is an interesting general collection, numbering among its treasures fine specimens of the work of such men as His of Leipzig, Cunningham of Dublin, or the lifelike reproductions of skin and venereal diseases by Baretta of Paris. In 1888, Dr. Billings, as

President of the Congress of American Physicians and Surgeons, delivered a valuable historical address on "Medical Museums," in which the Army Medical Museum is described at length. He reviews the development of these institutions, their probable origin from the hanging up of votive offerings in the ancient Greek Asclepieia; the great collections of Ruysch, Fontana, the Hunters, Abernethy, Dupuytren, Orfila, and the Warren Museum of Boston; and of his own collection, he remarks that although at first limited to medico-military specimens, "of late years, its scope has been greatly broadened, and is now nearly the same as that of the Royal College of Surgeons":

The medical museum hints at matters which lie outside the scope of known physical and chemical laws. Physicians have not, as a rule, been very virulent theologians; their studies and their daily work tend to give them compensation of bias in this particular, and, therefore, in this age of transition in beliefs, it is not so true of them as of others, that "the old hopes have grown weak, the old fears dim, the old faiths numb." In our medical museum yonder may be found abundant illustrations of the results of physical and chemical actions and reactions upon what was once living matter, and was connected with centres of consciousness, of intellect, of emotions which imply something more than ordinary protoplasm, or mere metabolism. It brings together strange company. The men who dwelt on the sides of the Andes in the old Aztec days, the men who built cities in the Gila Valley centuries before the days of Columbus, the Esquimaux, and the Indian of the plains, black and white, red and yellow, all sorts and conditions of men are represented in those bony caskets which once held their centres of life and thought; but now are reckoned only as so many crania in the Museum catalogue. The great majority of the pathological specimens imply either suffering or death, or both, of the individual from whence they came. Some of them are the results of intemperance, of lust, of folly and

crime; but some are the results of unselfish sacrifice for the good of others, true flowers of blood and pain. A large group of them form one of the relics of an acute paroxysm of disease of a great nation. The old pensioner likes to keep the battered ball which crippled him, and so these relics have an interest beyond that which is purely professional. That the nation is not crippled by its loss, takes nothing from their interest, and the fact that we are physicians does not imply that we look upon them from a medical or scientific stand only. Those of the combatants who survive are now better friends than ever, and the museum specimens, coming as they do from the sick and wounded of both armies, and contributed by both Union and Confederate surgeons, enforce the lesson of the unity of the profession and of its interests, as well as that of our country.[1]

In September, 1888, the Congress of Physicians and Surgeons was held in Washington, and in connection with his presidential address on Medical Museums, Dr. Billings gave a reception to the members of the Congress at the newly constructed Army Medical Museum. Among the foreign visitors at the Congress was the distinguished German army surgeon, Friedrich von Esmarch, who, with his wife, was Dr. Billings's personal guest. By his marriage with this lady, who was a royal princess, Baron Esmarch became uncle to the present Emperor of Germany. Of her visit to the reception in the Museum, Dr. Fletcher used to relate an amusing little anecdote. The only beverages served at the reception were strong waters and the ubiquitous punch. During the evening, Dr. Fletcher was approached by an Irish messenger, one of the old soldiers of the Civil War, who announced in trembling whispers: "Doctor, doctor, the Princess has asked for champagne!" Fletcher, with his admirable *savoir faire*, at once whispered back: "Take the lady whatever

[1] *Tr. Cong. Am. Phys. and Surg.*, 1888, New Haven, 1889, i., 377–378.

you have, John; she'll understand,"—and so it turned out.

To this period belong a brilliant series of memorable addresses on varied subjects, in particular the presidential address to the Philosophical Society of Washington, on "Scientific Men and their Duties" (1886); that, before the Association of American Physicians on "Methods of Research and Medical Literature," giving a valuable bibliography of reference books (1887); the lectures before the Lowell Institute of Boston on the history of medicine (1887–88); the Commencement Day address on "The Medical College of Ohio before the War" (1888); the address at the opening of the Johns Hopkins Hospital, (1889); the Cartwright Lectures on "Vital and Medical Statistics" delivered before the Alumni Association of the College of Physicians of New York (1889); the address on "Public Health and Municipal Government" delivered before the American Academy of Political and Social Science at the Art Club, Philadelphia (1891); the witty discourse on "American Inventions and Discoveries in Medicine, Surgery, and Practical Sanitation" read at the celebration of the beginning of the second century of the American patent system at Washington, D. C. (April 8–10, 1891); that on "Ideals of Medical Education" delivered at the commencement of the Medical Faculty at Yale University (June 23, 1891); the important paper on international uniformity in medico-military statistics, read at the International Medical Congress at Berlin (1890); the addresses delivered at the opening of the Laboratory of Hygiene of the University of Pennsylvania (February 22, 1892) and the William Pepper Laboratory of Clinical Medicine (December 4, 1895), both planned by Billings; the address to the University Extension Classes at Oxford, England, on "Hygiene in University Education" (August 7, 1894), and the Emersonian discourse on

"Waste" given on commencement day at his *Alma Mater*, Miami University (June 20, 1895).

In all these, Billings shows the easy mastery of his subject, the wide and well-remembered reading, the wealth of witty and apposite allusions, the clarity and perspicuity of phrase, which had long before brought him into constant request as a most effective and forcible speaker on occasions of this kind. Of his appearance and manner in this connection, Dr. Weir Mitchell has said:

> On public occasions, his personality stood for something in the estimate of the man. Tall and largely built, he was as a speaker in the after-dinner hour or when addressing a body of men a commanding presence, with flow of wholesome English, ready wit and humour such as rarely came to the surface in his ordinary talk. The figure of athletic build, the large blue eyes, a certain happy sense of easy competence, won regard and held the respectful attention of those who listened. For me there was always some faintly felt sense of that expression of melancholy seen often in men who carry through a life of triumphant success the traces of too terrible battle with the early difficulties of their younger days.[1]

Such addresses, each a finished production in itself, were thrown off by Billings as literary *jeux d'esprit*, odd jobs, trifles by the way, and incident to more important labours. In 1885, he had entered into an agreement with a firm of Philadelphia publishers to produce a National Medical Dictionary, to contain all technical terms in medicine, pharmacy, and the collateral sciences, currently used in English, French, German, and Italian literature. With the collaboration of W. O. Atwater, Frank Baker, Swan M. Burnett, W. T. Councilman, James M. Flint, Charles S. Minot, Henry C. Yarrow, and others, this work was completed on the co-operative plan and published, in

[1] S. Weir Mitchell, *Science*, N. Y., 1913, n. s., xxxviii., 832.

two large volumes, in 1890. It contains appendices of tables of weights and measures, poisons and antidotes, and other data, but in spite of the able performance of the editor and his collaborators, the publication had only a "success of esteem," the principal reason being that a dictionary in more than one volume is always too unwieldy and unhandy for practical purposes. To physicians who read and employ foreign medical terms, it had and still has its use, but it was objected against it that it contained definitions which did not define, and other signs of hasty preparation, and it has long since been superseded by the current one-volume medical dictionaries printed on thin paper. In Germany, however, this dictionary has been highly praised and appreciated by Franz von Winckel [1] and others.

From 1880 until the end of his life, Dr. Billings was constantly interested in the vital and medical statistics of the United States census, and in connection with the eleventh census, his separate reports were highly specialized, taking in such themes as the vital statistics of the Jews in the United States, the social statistics of cities, the vital statistics of the District of Columbia and Baltimore, and of New York City and Brooklyn, Boston and Philadelphia, and the status of the insane, feeble-minded, deaf, dumb, and blind. As an authority on public hygiene Billings was frequently asked to investigate and report upon the sanitary condition of cities, and hotels, as in the case of St. Augustine, Florida (1892); and his correspondence indicates that he did a vast amount of advisory work in which his knowledge and ability as a ventilating engineer was constantly brought into play.

In 1894, at the instance of the "Committee of Fifty for the Investigation of the Liquor Problem," he made a val-

[1] F. von Winckel, *Achtzehn Vorträge*, Wiesbaden, 1914, p. 60.

uable bibliography of alcoholism, and edited the volumes on the subject published by this committee.

In collaboration with Dr. Henry M. Hurd, Superintendent of the Johns Hopkins Hospital, he edited the papers and discussions on hospitals, dispensaries, and nursing at the International Congress of Charities, Correction, and Philanthropy at Chicago, 1893; and, at the suggestion of Weir Mitchell, Billings and Hurd prepared a valuable handbook of *Suggestions to Hospital and Asylum Visitors* in 1895.

In June, 1889, he was in England to receive the degree of Doctor of Civil Law from the University of Oxford, a distinction which has been conferred upon but few members of his profession.

TO MISS ACLAND (OXFORD)

S. S. *City of Chicago.* Queenstown, July 4, 1889. Here we are at anchor, waiting for the mails. Most of the few passengers have gone on shore, where they are no doubt bargaining for Irish lace and blackthorn sticks, but I have had enough of that sort of experience in days gone by and prefer to sit quietly on board and write a few parting notes. Every time I leave England it is more and more like leaving home, so that my affections are about evenly divided.

TO SIR HENRY W. ACLAND (OXFORD)

July 15, 1889. I reached home last night (Sunday), having come on a slow ship, over a smooth sea, and under a foggy sky. . . . During the voyage I thought much and long of Oxford, of your work there, of what you have accomplished and of what is yet undone of what you had proposed to do. I could only come to one conclusion and that is that it is extremely improbable that any complete medical school will be established in Oxford which will rely for its clinical teaching solely on the staff of the Radcliffe Infirmary, and it is certainly not desirable in the interests of either the profession or the Univer-

sity that such a school should be organized. You do want a pathological and a pharmacological institute with two of the best men who can be had at the head of them, and it seems to me probable, though by no means certain, that a more direct and closer connection with some of the great London hospitals than you now have would be advantageous. Just how these things are to be obtained I of course do not know, but somehow it usually happens that when it becomes possible to define a real want, a want not of one or two individuals but of a large body of educated men, the means come somehow. I think that there is a motto—"*Non eget arci,*" if you can manage to provide the arrows the bows shall not be wanting. . . . My recent visit to Oxford has given me many pleasant memories, of which your own great kindness is chief. I know that your chief object in life is to make other people happy, and I think it no harm to tell you how well you have succeeded with me and mine.

The next year (1890) saw him again in Europe, this time to address the International Medical Congress at Berlin on the subject "International Uniformity in Medico-Military Statistics." He spent three months in Europe in company with his wife, and his official instructions were such that he was enabled to visit the leading cities of the continent during his stay.

In 1892, he was again in Great Britain, to receive the honorary degree of M.D. at the tercentenary of Dublin University and an honorary fellowship in the Royal College of Surgeons of Ireland (July 7, 1892). In January of this year, he had been twice on the operating table for cancer of the lip, yet he delivered the address at the opening of the Laboratory of Hygiene of the University of Pennsylvania on February 22d, and, the following day, was again operated on by Halsted of Baltimore for the troublesome condition. Throughout the same year, he was lecturing on hygiene at the University of Pennsylvania and

the School of Mines (New York), on the history of medicine at the Johns Hopkins, made a report on the sanitary condition of St. Augustine, Florida, inspected the hospital at Fort Monroe, and lectured to the officers there on bacteriology. A few letters relating to his Dublin experience follow:

Dublin. July 6, 3 P.M. I received my honorary degree of Doctor of Medicine this morning in company with Sir Andrew Clark and Mr. Bryant, the Presidents of the Royal College of Physicians and of the Royal College of Surgeons.

July 7. At the banquet last night I was placed next to Henry Irving and we became exceedingly friendly. I shall probably see more of him in London.

Oxford, July 22, 1892. Here I am in Sir Henry's[1] library, looking out into the garden where the sun is shining. Tuesday evening Brunton gave me a dinner at the Athenæum at which Sir Archibald Geikie, Mr. Lockyer, Langdon Mitchell (son of Weir Mitchell), Mr. Black the novelist, Dr. Thorne-Thorne and several others were present, and everything went off beautifully.

In August, he was back in his Washington office again, working hard at the *Index Catalogue* and the census:

TO MRS. BILLINGS

August 18. It has been warmer since you left—not frizzlingly hot, but stewily warm, and you are well out of it. I am grinding away at the usual work and have no news of any kind—no new books—no new aches, nothing but a few pages of proof read—a few thousand cards assorted and a few pages of foolscap written. I have been considering the question, "Why are there more old women than old men." I suppose the only answer is that men are more vicious.

[1] Sir Henry Acland.

In January, 1893, Dr. Billings published *A Condensed Statement of the Requirements of the Principal University Medical Schools in Europe*, which has already been referred to. At the same time, his work on the census was beginning to attract attention, and in connection with his extensive reports on the vital statistics of particular American cities, he was asked by Mr. Walter H. Page, editor of the *Forum*, to write a series of articles bringing the results of his statistical surveys down to popular comprehension. These articles, published in the *Forum* during 1893–94, deal in an effective way with the hygienic defects in American cities and with the municipal sanitation of Washington and Baltimore, New York and Brooklyn, Boston and Philadelphia. A paper in the same journal on "Medicine as a Career" and another in the *International Journal of Ethics* on "The Effects of His Occupation on the Physician" bear witness to his interest in the deontology of his profession. These papers are not mere potboilers, but, like his best, precisely written and still readable.

In 1894, Billings was again abroad in connection with an address which he was invited to give to the University Extension Classes at Oxford on "Hygiene in University Education," in which his capacity for translating statistics into practical wisdom is again demonstrated. During this European sojourn, he seems to have spent some time in Germany, leaving Mrs. Billings with friends in England.

TO SIR HENRY W. ACLAND (OXFORD)

January 19, 1893. As to the broader outlook of the coming attempts at socialistic management of civilized nations I have little to say. I recognize the tendency, but my impression is that the arc of the pendulum is a limited one and that we shall go so far and no farther. Very possibly, however, the new generation will have to settle the matter by war in the good

old way. It is the final court of appeal in this world after all, and those who think it can be permanently avoided appear to me to be in error. I hope however that it may not come in my time, for I have seen more than enough of it. How far it may be possible by hygiene to preserve the weak and incompetent I do not know, but it seems to me that we ought to try, and leave the results in the hands of Divine Providence.

July 9, 1893. Mrs. Billings and I went to Chicago for a week and to our untutored savage natures the World's Fair appeared very magnificent. The buildings and grounds surpass in beauty and interest anything that I have ever seen. As to the exhibits I spent most of my time in the Arts gallery and the machinery and fisheries buildings. There is plenty for any one to learn, of course, but I did not try to do that—I just wandered about, like a country boy on his first visit to the city, looking at the shops and the people. I do not think I shall go to Chicago again this summer as I have considerable work in prospect. The Surgeon-General has decided to have an Army Medical School on the Netley plan organized at the Medical Museum, the first session to begin in November next. I am to be the Professor of Hygiene and must see to getting the laboratories fitted up and ready for work. I have also promised to write 100 pages of a *History of Surgery* for a new American Cyclopædia of Surgery, and these with my regular library and other work will keep me busy. . . . If I go to the International Congress of Hygiene at Buda Pesth, I shall hear your address on Sydenham, who is one of my great teachers.

TO MRS. BILLINGS

Frankfurt a.M., August 21, 1894. We have just returned from a pleasant day at Hamburg. The sun actually shone in the afternoon—the first time we have seen it for five days. . . . Yesterday we spent in looking at water works and sewage filtration works, and, at 8 P.M. we are to take supper with Mr. Lindley, the Chief Engineer of the city.

Nuremberg, August 24. Yesterday we went to Rothenburg, a quaint old mediæval town and arrived here this evening. We have been walking about and looking at the many curious sights which Nuremberg affords, and I for one am thoroughly tired. We go presently to a restaurant in a park outside the town for dinner, and to-morrow we go on to Munich. . . . We shall probably stay in Munich Sunday and Monday, then go to Salzburg for a day, and thence to Vienna, where we are to meet Drs. Hurd and Berkley.

The year 1895 marks the close of Dr. Billings's connection with the Surgeon-General's Library and its *Index Catalogue* through his voluntary retirement from active service in the Army to assume the full duties of Professor of Hygiene in the University of Pennsylvania. During this year, he published his history of surgery, continued his valuable reports on the eleventh census, participated in the opening of the William Pepper Laboratory of Clinical Medicine (December 4th), which was planned by himself, continued his lectures at the Johns Hopkins Hospital and the University of Pennsylvania and, most important of all, completed the first series of the *Index Catalogue*. During the sixteen years of its issue, volume by volume, the furtherance and completion of this work was the main object of his thought and the chief end of his endeavour. "Around it," says Woodhull, "his personal desires and official actions revolved together." His methods of work, checking the articles to be indexed in the periodicals at home if necessary, shaping the classification of subject bibliographies and redacting them after they had been prepared for the printer by his assistants, and reading the last printer's revision of the proof after it had been carefully read and corrected by Dr. Fletcher, have been already described, and they were continued until the end of his official career. Yet his view of his own relation to this work was at once modest and humorous:

While the librarian is in one respect only a sort of hod-carrier, who brings together the bricks made by one set of men in order that another set of men may build therewith—he is apt to take quite as much pride and satisfaction in the resulting structure, provided it be a good one, as if he had built it himself; and he has constantly unrolling before him a panorama which, though at times a little monotonous, contains as much wisdom, humour, and pathos, as any other product of the human intellect with which I am acquainted.

Of the valuable work of his acute and learned coadjutor, Dr. Robert Fletcher, who marked all the subject cards with the proper classification and did the careful proof-reading referred to, Billings speaks in terms of unstinted praise:

Soon after the publication of the specimen fasciculus, Dr. Robert Fletcher was assigned to duty in the library, and became the principal assistant in the work of preparing and printing the *Index Catalogue*. His service in this work has been continuous to this date, and I cannot sufficiently express my sense of its importance and value. The accuracy and typographical excellence of the volumes are largely due to his careful and skilful supervision.

In his valedictory, printed in the last volume of the first series of the *Index Catalogue*, Billings gives scrupulous credit to his other assistants for their work and concludes with the dignified simplicity which characterizes all his utterances relating to himself:

This is probably the last volume of the *Index Catalogue* which will be issued under my personal supervision, and, in closing the work, I can only say that it has been to me a "labour of love," and that I am very thankful that I have been allowed to complete it, so far as the first series is concerned.

Following Billings's retirement from active service in the Army a second series of the *Index Catalogue* was begun, and its careful redaction, the scientific classification of subjects, and the skilful proof reading were the work of Dr. Fletcher, even up to the date of his last illness and his death in 1912. It is now nearing completion. Meanwhile the official management and administration of the great library, the selection and purchase of its books, the selection of material for indexing, the enlargement and improvement of its resources, passed into the hands of the Army medical officers who succeeded Billings. As the cantors of the Thomasschule at Leipzig, the successors of Bach, had to be men learned in counterpoint, worthy followers of the great seventeenth-century music master, so these army surgeons have been men specially selected for their scientific and literary attainments. Huntington, one of the collaborators of the *Medical and Surgical History of the War of the Rebellion*, Merrill, distinguished by his work in ornithology, Walter Reed, a pupil of Welch and discoverer of the causal nexus and mode of prevention of yellow fever, and Walter D. McCaw, who specialized in tropical medicine and added greatly to the unique historical collections of the Library, have all been imbued with the spirit of enthusiasm and the interest in the literary side of medicine which Billings brought to his work. Under the able administration of its present Librarian, Colonel Champe C. McCulloch, the Surgeon-General's Library now contains 220,749 volumes, 331,802 pamphlets, and 5187 portraits.

CHAPTER VI

PHILADELPHIA

ONE evening in 1889, after Dr. Billings had completed his work on the Johns Hopkins Hospital, Mr. Henry C. Lea of Philadelphia, in response to an earnest appeal, agreed to erect at his own expense, at a cost of not less than fifty thousand dollars, a laboratory of hygiene for the University of Pennsylvania, provided that an additional sum of $200,000 were raised as its endowment, that Dr. Billings were secured as its director, and that the study of hygiene were made obligatory on students of medicine, dentistry, and other branches. The next morning, Dr. William Pepper was at Dr. Billings's home in Washington, before breakfast, and an agreement, which still exists, was drawn up and signed, to the effect that Billings was to commence duties as director of the University Hospital on January 1, 1890, to begin to prepare plans for a laboratory of hygiene, to study the best hygienic laboratories in Europe during the summer of 1890, to assume the professorship of hygiene in the University of Pennsylvania, and to lecture, if necessary, during the winter of 1891, while giving up his lectures at the School of Mines in New York. Upon completing the *Index Catalogue*, he was to request retirement from active service in the Army, and if such request were granted, to reside permanently in Philadelphia thereafter. Not only was the endowment stipulated

by Mr. Lea soon raised by public spirited citizens, $60,000 having been devoted to endowing the chair of hygiene by Mr. George S. Pepper, but an additional subscription of $50,000 was raised for the medical department and an additional guarantee of $20,000 per annum for five years was secured. Some years later (February 20, 1894), William Pepper, that "far-seeing, bold-planning man of the silver tongue and the open hand," as Billings has called him, subscribed $50,000 for the erection and partial endowment of the first distinctive laboratory for research in clinical medicine in America, which was planned by Billings and constructed by Cope and Stewardson.

During the academic session 1891–92, Dr. Billings, by permission of the Surgeon-General, began to lecture on hygiene and vital statistics at the University of Pennsylvania, the subject of bacteriology being treated by Dr. A. C. Abbott. These lectures were continued until Billings retired from the Army, after which he took up his residence in Philadelphia and became full Professor of Hygiene at the University, having previously planned and opened its Laboratory of Hygiene (February 22, 1892). As Director of the Laboratory of Hygiene, he suggested and supervised certain valuable original investigations which were presented to the National Academy and published in its memoirs, notably those on the influence of light and other agents on the typhoid and colon bacilli by Adelaide Ward Peckham, on the bacteria of river waters by James Homer Wright, and on the composition of expired air and its effects on animal life by Billings, Weir Mitchell, and D. H. Bergey. Yet, although he was able to stimulate his pupils and others to the production of such admirable monographs, Billings had no special aptitude for chemical or bacteriological investigations of recent type, and indeed stipulated that the technical manipulations in these sciences must be taught by his assistants. This was but

natural, for upon his earlier days of ardent microscopical work had ensued a long period of departmental routine, of public lecturing, of expert work in hospital construction and other branches of engineering, and his interests were shunted off into these activities. Before he went to Philadelphia, he had belonged to the older school of experimental hygienists, the school of Pettenkofer. But the production of such an important memoir as that of his pupil Wright on the bacteriology of the Schuylkill River, which was undoubtedly a forerunner of the great Belmont filtration plants of Philadelphia, goes to show that he fully appreciated the importance of what may be called the bacteriological school of hygienic research. As it is, his incumbency in the Philadelphia chair of hygiene was of short duration. He was in actual residence for only a year, his professorship terminating with his appointment as Director of the New York Public Library in 1896. During his residence in Philadelphia, he enjoyed the various Wistar parties, Mahogany Tree diversions, and other features of the social life of the city.

We get a glimpse of his university activities from one or two of his letters to Sir Henry Acland (Oxford):

2115 Chestnut Street, Philadelphia. October 22, 1895. We moved over here to the above address on October 1, and are slowly settling down into our new place. I had a sharp attack of gravel . . . but I managed to give all my lectures and am now feeling fairly well, though not very vigorous, for, as you know, a milk diet and alkalies are not stimulating. . . . I am going to have plenty to do here and if I am physically well I shall enjoy it. The associations are pleasant—we have a fairly comfortable house, and there is a chance to do some good work. I have in my laboratory a bright young woman, a Ph.D. of Zurich and a pupil of Koch, who has found several new species of pathogenic yeasts and is now engaged in experimenting with them.



JOHN SHAW BILLINGS
1889—ÆT. 51

November 23, 1895. I am now feeling very well, and have some enjoyment in work, of which I find plenty. I am giving my lectures to the graduating class of medical students, and looking after the work in my laboratory, some of which is very interesting. I have two good laboratory assistants and demonstrators, and if I can only get means to keep two or three men on original research work, I shall be quite happy—for a little while.

On November 27, 1895, Mr. John L. Cadwalader, one of the Executive Committee of the Board of Trustees of the New York Public Library informed Dr. Billings that he had been chosen as the Director of the proposed Library. After due discussion and deliberation, the latter referred the question to Mr. Charles C. Harrison, Provost of the University of Pennsylvania, at the end of the year (December 30th), stating that he had been in the service of the University for five years, during which time the Department and Laboratory of Hygiene had been organized, the University Hospital reorganized, and competent assistants obtained, who could carry on the work without interruption, if he resigned. To this end, he proposed carrying on his university work till the end of the scholastic year at a reduction in salary, in order to give two days in the week to the New York Library until June 1, 1896, upon which date he proposed his resignation should take place. "I make this request," he concludes, "not because I am in any way dissatisfied with my position and work here, nor for the sake of obtaining greater compensation, but because I believe I can best contribute to the public good by undertaking the New York work." The situation was a delicate and embarrassing one for both sides. Dr. Billings had given hostages to the University of Pennsylvania, he had planned two of its finest laboratories, he had less than a month before been tendered a banquet in the city with a gift of perhaps the largest purse ever raised for

a physician by private subscription, and he naturally felt disinclined to resign his professorship without express permission from the authorities of the University. The latter, his old friend Dr. William Pepper in particular, were very loath to let him go, and on December 31, 1895, Pepper sent him the following note.

DEAR DR. BILLINGS:

This is the last day of the old year. I have been looking into the New Year in the light of our interview of the other evening. The whole subject appears to me so serious that I beg that you will not allow your mind to reach any definite decision, nor make any positive reply until two or three of us have had the chance to discuss the situation fully with you.

Yours sincerely,

WILLIAM PEPPER.

Yet, so important were the issues at stake, that, largely through the good offices of Dr. Weir Mitchell, the whole matter was adjusted in a few days, the authorities waived their claim in favour of New York, and Dr. Billings resigned his professorship in the University of Pennsylvania to take effect on June 1, 1896.

Prior to this decision, in appreciation of the vast services rendered to the medical profession by his labours on the *Index Catalogue*, a testimonial banquet had been given to Billings at the Hotel Bellevue, Philadelphia, November 30, 1895, with the unique gift of a silver box containing a check for $10,000, "from 259 physicians of the United States and Great Britain, in grateful recognition of his services to medical scholars." The subscribers to this fund included all his old friends in England and the best names of the profession in America. The chairman of the banquet was Dr. S. Weir Mitchell. After the discussion of the menu, the first speaker to be called on was Professor J. M. Da Costa of Philadelphia, who said:

Dr. Billings has done the whole of literature, the whole of science, a great good by this unselfish work, which has been of the kind that builds up literature and science indirectly by removing obstructions and saving time. This work will continue for generations and generations to be a benefit. It is a great national credit; an illustration of what a powerful and rich government can do; an illustration of the tact and sagacity of the men successively in charge of the Surgeon-General's Office. It is a credit alike to the nation, to the Corps to which Dr. Billings belongs, and to the medical profession.

Dr. Mitchell, after a witty introduction, then presented the silver box containing the check in the following words:

In offering this box to my old friend, and the gentleman you desire to honour to-night, I would say that while the silver box contains this practical recognition of his services it also contains something more, as my imagination figures it. You all remember that phrase of Dr. Johnson's, "Wealth beyond the dreams of avarice." There is, as I think of it, within this box, for an imaginative man, that wealth which represents the good feeling, the friendly opinions, the thankfulness, of the scholarship of two continents. Also I may say that this wealth represents a noble avarice, of that kind which my friend has shown all his life—a desire to be loved and respected by those in our profession whom men most rightly honour.

Dr. Billings said, in acknowledgment and in reply:

I think that not the most eloquent speaker among you would feel himself at all able to make a fitting reply to the addresses to which you have just listened. It is impossible for me to do so, and I can only say that I thank you all from the bottom of my heart. To judge from my own sensations, that is not going very deep, because to me my heart seems at present to be in the neighbourhood of my larynx.

Of course, in this honour I am, in a way, but a representative, a large part of it being due to individual personal friend-

ship and good will. The work has been rendered possible by the co-operation of many men working for many years, and a very large number of those men I see around this table. Besides, a very large part of this has not been due to individual merit, but, as you know, to opportunity.

After paying a grateful tribute to the co-operation of Dr. Fletcher and Dr. Chadwick, and giving a brief account of his earlier experiences in library work, he concluded:

As to this gift, I accept it in the spirit in which it is given; I cannot yet say how it shall be used. It represents power; it represents the power of getting knowledge; the power, perhaps, of developing knowledge and increasing it. I will endeavour to use it in a way that will perhaps be satisfactory to those who have contributed it. In conclusion, gentlemen, I beg of you to accept my warmest and most heartfelt thanks, and the assurance of my appreciation of your kindness.

Dr. James R. Chadwick of Boston was next called upon, and after a few introductory remarks, read a translation from the diploma of the University of Munich, conferring upon Dr. Billings the honorary degree of Doctor of Medicine (1889):

"A man who deserves of his country and of literature the highest praise, not only for his numerous important writings on the relations of physicians, on the proper construction and administration of hospitals, on the public health in the United States according to the precepts of the science and art of hygiene, on the preservation and improvement in the health of the army, but also for the great collections thereto relating, which he has established and extended; a man, who in the *Index Medicus*, of which he is editor, includes, by indefatigable industry, all the branches of medicine that are being advanced throughout the whole world, who, also, as author of the book that is entitled the *Index Catalogue* of the Library of the Surgeon-General's Office, United States Army, which, by

the remarkable munificence of those who control the Government of the United States, has been laid before an immense number of learned men, has entitled himself to the gratitude of physicians and students of history throughout the whole world, and has built for himself a monument more lasting than brass."

Dr. Chadwick then went on to say:

One of the most valuable of his many qualities has been his common-sense. "He is like a pin," to use a Frenchman's simile, "in that his head prevents his going too far." His knowledge of men and his ability to secure their enthusiastic co-operation form the secret of much of his power. For instance he not only despoiled my private library of many of its treasures in the early days of our acquaintance, but persuaded me to listen with equanimity, when, as at the dedication of the medical library in Boston, he boasted of the fact publicly, and intimated that the experience had doubtless proved a valuable object-lesson for me as a librarian. Mr. Thomas Windsor, formerly Librarian of the Manchester Medical Library, in England, is another who has succumbed to his wiles, and from the beginning has sent box after box of medical rarities culled from his extensive private library, and this, despite the fact that he is the most inveterate collector and reader of books, and has a more intimate knowledge of their value than any living man. We are but types of his many victims.

He concluded with a tribute to Dr. Billings's faithful assistants in the Surgeon-General's Library, in particular his loyal coadjutor, Dr. Robert Fletcher.

In a witty and graceful reply, Dr. Fletcher said:

While the thought of a great Index Catalogue might have occurred to thousands of persons, there have been more than once attempts made to deprive Dr. Billings of the credit of the first conception, and, indeed, of some of the carrying out of the work connected with that *Index Catalogue*. I take the opportunity to say—and there is no man living who can speak more

positively on that subject than I can—that I know positively that the first conception of this stupendous work, the planning of it, the arrangement, the classification—in short, the whole merit of it, are all due to Dr. Billings exclusively.

Dr. Abraham Jacobi of New York then spoke with warmth and eloquence, concluding as follows:

And now a word about this newcomer and old friend. At the close of my remarks I mean to become quite personal and tell a story. Those who know me well are aware of my not committing many sins of that kind. I am even suspected of knowing no stories at all. But there are a few in my repertory, and their beauty consists in their being true—some of them. Now, there was a letter written fifty years ago, somewhere in South America. It bore the address, "Alexander Humboldt, Europe." That letter was not slow in finding the little great man in his side street in Berlin. In the same way the honoured guest of the evening is called by me and all of us "Billings," not even Dr. Billings. Not in my most melancholic dreams did it ever occur to me that he would condescend to descend to our level. I say our level, for I am afraid there are but few here so distinguished as not to be professors. Most of us, I fear, *are* professors, more or less. And Billings is one of us now, I am told. But I need not be told that he will remain big enough to require no title additional to that which he carried in Washington. That title was "Billings." And I also know that when in Europe—which, after all, is also a part of the world—and the rest of the continents, men whom we all know and revere count the very best names of all countries, one of the few will be "Billings, of America."

At the conclusion of Dr. Jacobi's speech, Dr. William Osler of Baltimore made the following announcement:

I have to make the very pleasant announcement that though Dr. Billings has left Washington, and the Army Medical Museum and that the Army Library will know him no more

as we have known him there, yet his counterfeit presentment is to appear on the walls of the library. A sufficient fund has been raised to have Dr. Billings's portrait painted, and it will be presented to the Army Medical Museum.

The portrait referred to by Sir William Osler was painted by Cecilia Beaux of Philadelphia and now hangs in the Library hall of the Army Medical Museum. In accordance with the artist's desire, Dr. Billings was painted as a standing figure in full uniform and wearing the scarlet gown which was his vestment on the occasion of receiving the degree of Doctor of Civil Law at Oxford in 1889. The picture is an admirable one, conveying the grave dignity and reserve which were characteristic of Billings, although the countenance, while life-like, bears some marks of the illness which had begun to undermine the later years of his life.

CHAPTER VII

THE NEW YORK PUBLIC LIBRARY

IN 1839, Mr. John Jacob Astor, in a codicil to his will, bequeathed $400,000 for the erection and management of a public library for the city of New York. This library, situated at 40 Lafayette Place (later called 425 Lafayette Street), and completed in 1853, four years after Mr. Astor's death, was the first free public institution of the kind to be established in the metropolis. One of the original board of nine trustees was Washington Irving, who was its first, and for the remainder of his life its only president. The resources of the Astor Library were trebled by William B. Astor and his grandsons; an adjoining structure was added to the original building by the former in 1859, and a second addition, erected by John Jacob Astor, was opened in 1880. The charter of the Astor Library was Chapter I. of the New York Laws of 1849. Chapter II. of the Laws of 1870 was the charter of a library founded by James Lenox, an old and wealthy New Yorker of Scotch extraction, who gave for this purpose land, a library building, and books of value, amounting *in toto* to two million dollars. The Lenox Library stood on Fifth Avenue overlooking Central Park, between 70th and 71st streets. It contained many rare books, maps, and other valuable curiosities. A third benefaction to the city of New York was made in the will of Samuel J.

Tilden, leaving the residue of his large fortune "to establish and maintain a free library and reading room in the City of New York," the whole matter to be in charge of a corporation to be known as the Tilden Trust. Upon Mr. Tilden's death in 1886, the Tilden Trust was duly created by the Legislature, but after a long dispute, the courts ultimately decided in favour of Mr. Tilden's relatives.

By a compromise with some of these, however, more than two million dollars of Mr. Tilden's residuary estate were eventually acquired by the Trust, together with a library numbering between fifteen and twenty thousand volumes. Perceiving that Mr. Tilden's original idea of a great free library system could not be carried out with these means, his trustees began to cast about for some way to make his good will to the public an accomplished fact. In 1892, one year after the decision of the Court of Appeals, an act of the Legislature was passed authorizing consolidation of libraries in New York City. Many difficulties arose, however, and the whole matter remained pending until the spring of 1895 when, on May 23, 1895, the agreement of consolidation of the Astor, Lenox, and Tilden foundations was duly executed. By this agreement, the new corporation came into possession of certain vacant and unproductive land, several million dollars' worth of property producing income, and a collection of books amounting to about 350,000 volumes. Nearly half the annual income had to be expended in lighting, heating, cleaning, and repairs, leaving but little for the purchase of books and periodicals. It was the ambition of the trustees to place the New York Public Library upon a footing with the British Museum, with nearly two million books, or the Bibliothèque Nationale of France, with its three million. To do this, it was necessary to acquire a suitable site for a new building of large dimensions, to induce the city to undertake its construction, and to find some man of

approved experience and unusual ability to act as its director and librarian. On November 26, 1895, the Executive Committee of the Board of Trustees, which included such men as John Bigelow, John S. Kennedy, John L. Cadwalader, George L. Rives, S. V. R. Cruger, Lewis Cass Ledyard, and Alexander Maitland, decided in council that the most available executive for the great object in view was unquestionably Dr. John S. Billings, and Mr. Cadwalader communicated with Dr. Billings to this effect on the following day.

The story of Dr. Billings's release from his professorship in the University of Pennsylvania has already been told. On January 15, 1896, the following resolutions were adopted at a meeting of the Executive Committee of the Board of Trustees of the New York Public Library.

Resolved, That this Committee, pursuant to the power and authority conferred upon it by Resolution of the Board of Trustees, adopted December 11, 1895, hereby appoints John S. Billings, M.D., LL.D., etc., Superintendent-in-Chief. . . .

Resolved, That Dr. Billings shall only be required to attend in New York, prior to June 1, 1896, a portion of the time, and upon such days as may be hereafter arranged. . . .

Resolved, That the Superintendent-in-Chief be requested to examine into and report upon the condition of the Libraries of this Corporation, and the organization and conduct of the same, with such recommendations as he may deem expedient.

Resolved, That the Superintendent-in-Chief be requested to examine and report to this Committee as to the cost of introducing electric light into the Astor Library Building, or some part of it, during longer hours or in the evening.

G. L. Rives,
Secretary.

In accordance with these agreements, Dr. Billings resigned his professorship in the University of Pennsylvania on June 1, 1896, and after spending the summer in Europe



The New York Public Library

to attend the International Conference held in London under the auspices of the Royal Society, to consider the project of a general Index of Scientific Literature, and incidentally to examine into the methods of management of the larger European libraries, he took up his residence in New York City in September, 1896. During the earlier part of this year, his principal duties in connection with the New York Library consisted in planning its general administration and in conferring with the Committee on Site as to selecting the most suitable locality for constructing the proposed new building. By an agreement between the Astor Library, the Lenox Library, and the Tilden Trust, it was provided in substance that if releases of the restrictions affecting the property of the Lenox Library on Fifth Avenue and 70th Street could be delivered to the Board of Trustees, then that property should be selected as the site. Upon inquiry into this matter, it was found that one of the principal Lenox heirs expressly declined to join in any releases freeing the property from these restrictions. It was therefore decided on February 5, 1896, that, "in view of its central location, its large area, its immunity from fire and its convenience of access from all parts of the city and suburbs," the abandoned Murray Hill reservoir, on Fifth Avenue between 40th and 42d streets, which for over fifty years had been part of the Croton water system, should be selected as the site of the principal building, and that application should be made to the city authorities and Legislature for such enactment as would enable the city to furnish this site for the purpose.

In arriving at a conclusion the Committee have been aided by the views of Dr. Billings, with whom they have discussed the subject at length, and also by the suggestions of a number of members of the Board who were invited by the Committee to confer with them.

The main question before the Committee was "the kind of library to be established, and the general character and scope of the enterprise." If the Library were designed mainly and merely for the convenience of scholars, these would consult it wherever situated, and convenience of access would be of little moment in the selection of a site. But if a circulating or lending library, for the use of the general public, rather than a reference library, should be desirable, it must be situated in a central locality. The Committee felt that if the New York Public Library were to be a library for scholars pure and simple, the public would be keenly disappointed and the library itself would fail of the governmental or municipal aid extended to the great collections of London, Paris, Washington, and Boston. It was therefore decided to appeal to the city for aid in securing a site, in constructing and equipping a new building and in establishing branch circulating libraries to be conveniently located throughout the city. Thus the working status of the New York Public Library, even in its most recent phases, was planned early in February, 1896.

LETTERS TO MRS. BILLINGS

U. S. M. S. *New York*, Saturday, June 20, 1896. We are about 1400 miles from New York—clear of the Banks—the sun is shining, the sea is as level as a floor (more level than our dining room floor in Chestnut St.), looks like a sheet of blue ground glass, being just crinkled a little, and the deck is crowded with ladies who think it is beautiful sailing. It rained steadily on Wednesday and Thursday, and the sea has been perfectly smooth, with no wind except that made by the motion of the steamer herself, and, on the whole, I call it monotonous. For the first two days out the few teeth I have left made themselves painfully conspicuous, and I had to avoid all food that was not very soft, but I am much better to-day and had a good sleep last night. My room-mate is Monsieur Michel Revon, Professor of Law in the Imperial University at Tokio,

Japan, and seems to be a highly educated and attractive Frenchman, who does not speak much English, but who entertained me for two hours last evening with an account of some of his Japanese adventures. The only passengers with whom I have become acquainted are two doctors, brothers, named Fisk, one being a young New York surgeon and the other living in Denver. There are three pretty girls on board but I have not spoken to any woman thus far. Miss Della Fox is a passenger, also the Hon. Thomas Ochiltree who won the pool to-day on the steamer's run. . . . By this time I suppose most of the things are packed up and you are living in the north end of the dining room. . . . I am reading through the ship's library at the rate of two volumes a day, to the disgust of the librarian who thinks that I give him a great deal of trouble.

Wednesday, June 24. 9 A.M. Here we are coasting along the shores of Devon—will land about noon.

37 Upper Brook Street, Grosvenor Square, London. June 26. C. is looking very well indeed and has been out all the morning with me superintending my shopping. I go to Mortimer with her next week to see the babies, and shall then probably go on to Oxford for a few days. It is warm and the sun is shining, and I am going with C. and D. this afternoon for a ride to Richmond. To-morrow, I begin work in the British Museum and among the booksellers. I landed at three P.M. on Wednesday and Dr. Notter was on the dock waiting for me. I stayed that night with him and came up to London with him yesterday morning. Had a long and pleasant talk this morning with Mr. Bayard, who has just received his D. C. L. at Oxford and is in fine spirits. I suppose that by this time all your packing is nearly done, and no doubt the decorators are at work on the New York house.

Oxford, July 3. I find Sir Henry very well, considering; he seems better than he was two years ago. . . . I dined with the Bruntons on Tuesday last, and with the MacCormacs on Wednesday.

Manchester, July 8. I am here for two days with Mr. Windsor, who is convalescing from a slight fever and is in bed, but not really very ill. I was three days at Oxford with Sir Henry Acland and had a very pleasant time. He is better than he was two years ago, and my "English Cousin" is also in fair condition and took a new photograph of me of which you are to have a copy. Then I went to Birmingham, saw the Free Library, and came on here. To-morrow I go to Leeds, and on Saturday return to London.

Marketgate House, Crail (Scotland). July 25, 1896. Here I am with the Chienes in the old house at Crail, having come over from Edinburgh last evening to spend Sunday with them. . . . Ella is here with her husband, Mr. D., a bright young Englishman, and with her baby "Hilda," who has a temper and views of her own on many points. I have had a very successful stay of three days in Edinburgh, having picked up over 500 volumes of pamphlets, a valuable manuscript, etc. . . . To-morrow I go to Cambridge *via* London, to stay with Dr. Allbutt until Wednesday. Then I go to London and dance attendance on C.'s dentist for two or three days, at the end of which time I hope that I may be able to eat some bread. For the last week I have subsisted on milk, soft boiled eggs, and Scotch whiskey.

Amsterdam. August 4. Professor Langley came over with me from London. Chadwick was waiting for us and we have had a good time, and go to The Hague to-morrow evening. I have had a most successful book hunt here and have bought three or four boxes full, including some very rare things and some wonderful old maps of America. . . . My sore jaw is becoming quite free from pain, and, although I live chiefly on omelettes and fish, I am very comfortable. . . . I stayed with the Bruntons last Friday and Saturday. Sunday I was with Burdett who is more friendly than ever, and wants me to come to his summer place when I get back to England. It is down in Surrey.

Hôtel de la Paix, Ghent. August 8. Chadwick and I are getting on well. In The Hague on Wednesday, Leyden and Haarlem on Thursday, Antwerp yesterday, and to-day we are here in Ghent—an interesting old Flemish city. We walk about among the old book stalls until we are thoroughly tired, and by dinner time, are quite hungry. To-morrow we go to Bruges, the next day to Brussels. I am fairly well, and enjoying the fun which Chadwick makes. For two days we have been trying to find a cigar that we can smoke, but without success. . . . I begin to feel very much like getting back, I want to see you and to get to work again, but I have four weeks to fill out before I can start.

Hôtel du Grand Monarque, Brussels, August 11. Chadwick and I have had a very pleasant week in the Low Countries, having been in Amsterdam, Haarlem, Leyden, The Hague, Antwerp, Ghent and Bruges. We have walked all over these places, going into every library and old book shop. . . . From here we shall go to Louvain, Charleroi and Namur, and reach Paris on the 17th.

11, rue Chardin, Trocadero, Paris. August 16. We got to Paris last night and this morning Dr. Chadwick went to the country to see his brother, and I have accepted Mrs. Very's invitation to stay here two or three days. Larry Benet and his mother live just around the corner and I shall be very much at home. I have a great deal to do in Paris for the Library. . . . Chadwick is a delightful travelling companion, and the loss of his trunk has not made him a bit morose, as I am afraid it would have done me.

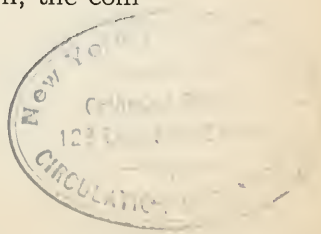
Hinhead School, Shotter Mill, S. O. Surrey, August 23. Just arrived here at Mr. Burdett's country place for the summer. . . . I had a pleasant week in Paris, stayed with Mrs. Very, dining somewhere with her, Mr. Benet and Dr. Chadwick every night. I intended to have two weeks at Swanage and Salisbury before I sailed, but I found here a letter from Mr. Bigelow, requesting me to examine a library in Berlin if possi-

ble, and I shall telegraph to Berlin in the morning to learn whether it is accessible. If it is, I shall go, and that will take a week, so that I shall have no time to spare.

Following the decision of the Committee on Site to obtain the ground of the old Murray Hill reservoir as the site of the New York Public Library, serious difficulties were encountered before this could become an accomplished fact. This piece of ground had been originally a part of the common lands of the city of New York, having been granted by the Crown to the corporation, under the Dongan Charter of 1686. Under the rulings of the courts, the State had no power to dispose of this land, and, under the law, the Corporation of the City could not act in the matter without legislative authority. To this end, a special legislative act had to be passed, and the consent of the Mayor, Aldermen, and Commonalty of the City obtained. After long deliberation with the Board of Aldermen, the city authorities finally voted for the removal of the reservoir in November, 1896. To get the city to undertake the construction of the library building another act of the Legislature was necessary, but as soon as the city authorities became vested with this power, things began to move rapidly, and, by the spring of 1897, two years after the original consolidation, preparations for the architectural competition were made. During the first half of this year, Dr. Billings, in company with Mr. John L. Cadwalader, made careful examinations of many of the leading libraries of the United States, adding to his European experiences gained in the preceding summer; and it was at Atlantic City (April 5th) that he roughed out in pencil, as the basic idea for the architectural competition, the original sketch plan, from which Professor William Ware, then of the Department of Architecture, Columbia University, developed the further plans. This

original plan of the first floor (350′ x 225′) corresponds closely with the present dimensions (390′ x 270′) having, then as now, the main entrance on Fifth Avenue, the book stacks in the rear, the current periodicals at the front, with interior courts to insure an abundance of light. It is characteristic of the man that his original design included a children's reading room to the left of the main entrance. Two copies of Billings's original plan in pencil exist; one in his private note-book, which is in possession of his family, the other, having been for many years in the possession of Professor Ware, was finally given by him to the present Director, Mr. Edwin H. Anderson, and is now deposited in the vaults of the Library.

On May 21, 1897, the Board of Trustees of the Library issued a proposal for the architectural competition, to be based upon the diagrammatic plans drawn up by Professor Ware from the sketch and suggestions made by Dr. Billings. In this document, the Trustees proposed to obtain plans by two consecutive competitions: an open one, affording sketches from New York men, followed by a restricted competition, requiring finished drawings for which the competitors were to be paid $800 each. The original site of the Bryant Park reservoir was a plot of ground measuring 482′ x 455′, and upon this the Trustees proposed to put up a thoroughly fire-proof building measuring 225′ x 250′ to cost $1,700,000, exclusive of heating, lighting, ventilation, furniture, book stacks, and shelving and the expenses for architects' fees and the removal of the reservoir. The committee passing upon the preliminary competition were Professor Ware, Dr. Billings, and Mr. Bernard Green, of the Library of Congress, Washington, D. C. The twelve successful competitors received a premium of $400 each, and these, and not more than six other persons or firms named by the Trustees, were then invited to take part in the second competition, the com-



petitors receiving $800 each for their finished drawings. These drawings were adjudged by a jury of seven, consisting of three members of the Board of Trustees, the Director (Dr. Billings), and three practising architects to be chosen by the competitors. Eighty-eight architects took part in the first competition, which closed on July 15, 1897. At the second competition, which closed on November 1, 1897, the jury of award selected three designs as being the most meritorious, and from these, the Board of Trustees selected the one that the jury had declared to be the best, which was the set of plans sent in by the late John Merven Carrère and Thomas Hastings, architects of New York City. The successful plans of Carrère and Hastings were submitted to the Board of Estimate and Apportionment of the city of New York, which, by resolution of December 1, 1897, approved them and authorized the Department of Public Parks to remove the Bryant Park reservoir and to construct, maintain, equip, and furnish a suitable fire-proof building after the plans approved. On December 6th, the Department of Public Parks adopted suitable resolutions for the construction of the Library building. On December 8th, a contract between the city of New York and the New York Public Library was duly signed and sealed, whereby the city agreed to construct and equip the building, while the Library corporation undertook, on its part, to place and arrange its entire book collections in the building as soon as practicable after completion and to make the Library free and accessible to the public on all week-days including holidays,with a free circulating branch to be kept open on Sundays and all other evenings until at least ten P.M. On December 9, 1897, the Department of Public Parks entered into a formal contract with Carrère and Hastings for the construction and equipment of the building, and the work was now ready to go forward.

On February 16, 1898, Messrs. Carrère and Hastings, the architects, submitted to the Department of Public Parks the necessary form of contract for removing the reservoir and disposing of the debris, which was approved on March 3d and submitted to the Board of Estimate and Apportionment, with a requisition requesting the sale of bonds to the amount of $150,000, on March 13, 1898.

Meanwhile, Billings was settling down to the gigantic labours of supervising the reclassification and recataloguing of the books and pamphlets and their rearrangement on the shelves, in which he soon attained his customary vigorous stride. It was necessary to make a complete reclassification and a complete new catalogue of the entire collection, substituting for the "fixed location" by which books had formerly been classified in both the Astor and Lenox Libraries a "relative classification" by which books were classified by subject and arranged in groups that were independent of the numbering of the shelves on which they happened for the moment to stand. The scheme of classification was blocked out by Dr. Billings with particular reference to the character of the collections owned by the Library, and is substantially the scheme still used in it. The catalogues at the time of consolidation existed partly in print, partly in manuscript, partly on cards of standard size, partly on cards of smaller size, partly on cards of three different larger sizes; in no one place was there a complete author or subject record of all the books owned by the library. Dr. Billings began a systematic recataloguing of the entire collection on a uniform plan, making an author catalogue for official use; and, for public use, making, as he had done for the Surgeon-General's collection, an "index catalogue" of authors and subjects arranged in one alphabet, a "dictionary catalogue." All this he managed in his cool, deliberate

way, *ohne Hast, ohne Rast*, and in his report for the fiscal year 1897–98, he was already able to make a goodly showing of work done. The consolidation of the collection of musical literature and the collection of Bibles, the reclassification of the Hebrew collection (Schiff Fund), the cataloguing of the manuscripts, incunabula, and maps, the indexing of special periodicals, independently and in co-operation with other libraries, were among the features of the work. He was especially interested in completing the files of old periodicals and transactions of societies, to which 6994 volumes were added during the year. In June, 1898, there were some 457,143 books and 119,512 pamphlets in the Library, of which about 45,000 volumes were periodicals. Of these, a careful selection was made for indexing.

During this busy year, as later, he took an active part in all the social diversions and functions into which he was drawn, dining out, giving talks before various societies, and attending the social gatherings of the Round Table and other clubs. In June of this year (1898), he had his first experience with Canadian fishing, sojourning with Weir Mitchell and Cadwalader at the Cascapedia Club.

TO MRS. BILLINGS

June 27, 1898. It is one P.M. Weir Mitchell and myself, in our shirt sleeves, are resting after three hours' work in a canoe on the river, during which he caught two salmon weighing 23 and 27 lbs. respectively, and I caught one salmon weighing 28 lbs. and two trout, being my first experience in this kind of sport. My right arm aches and I can't write that beautiful copper plate hand which you admire so much, but I feel very fine, and several inches larger in every direction. Mr. Cadwalader has just left for New York, so Mitchell and I are alone together for a week. He is much better, and is fairly cheerful, joining in talk like his old self. It is a beautiful wild river, the

shore opposite the little club house rises abruptly in bold hills covered with pine, cedar, birch and beech trees. I have tried to make a little sketch of the outline at the head of this note. Mitchell has an universally accomplished coloured man, Daniel, who is an excellent cook, and who looks after us on shore, and two boatmen who take us out in the canoe. The coffee, eggs, and griddle cakes this morning were fine. I wanted two blankets over me last night, and when I got out of my cold bath this morning I danced around very lively to get warm while I was dressing. Day after to-morrow Mitchell and I are going up the river about 14 miles, taking the indispensable Daniel, and camp for three days.

He visited England during the summer:

TO SIR HENRY W. ACLAND (OXFORD)

September 27, 1898. We arrived yesterday morning after a ten days' voyage which was smooth, but rather monotonous. The principal talk among the physicians here just now is with regard to the great amount of sickness which has been prevailing among our volunteer troops—not so much among those who went out of the country as among those who were in camps within the limits of the United States. I was this morning in a large ward full of typhoid fever cases coming from a camp in this vicinity, and can only think that there has been great want of proper management. Of course I find a great pile of work awaiting me—but I am glad of it—for I feel like doing something—having had a good rest. A Japanese architect from Tokyo is here wanting information about library plans—as they are about to erect a national library at Tokyo—and brings me a letter from Tanaka the librarian.

The year 1900 was taken up with the question of the consolidation of the numerous free circulating libraries of the city with the New York Public Library, correspondence on this matter having been opened with the Comptroller Mr. Bird S. Coler, on June 20th. Dr. Billings was re-

quested by the Finance Department of the city to undertake an investigation of these libraries, and his report of September 15th gave a tabulated statement of the status of the fourteen libraries concerned, with the exception of that of the Mechanics' Institute, which was withheld for technical reasons. Acting upon this report, the Executive Committee of the Library recommended that the municipal authorities of the city should make appropriation for these free libraries under such conditions and restrictions as would insure a much-needed centralization and organization with satisfactory supervision and accountability. In due course, consolidation was effected with the New York Free Circulating Library, with eleven branches; the Washington Heights Free Library; the St. Agnes Library; the New York Free Circulating Library for the Blind; the Aguilar Free Library, with four branches; the Harlem Library; the Tottenville Library; the Library of the University Settlement; the Webster Free Library; the Cathedral Free Circulating Library, with five branches, being nearly all the circulating libraries of the city. This enlargement for the public good was to receive a new impetus through the generosity of Mr. Andrew Carnegie who, on March 12, 1901, sent the following letter to Dr. Billings:

Dear Dr. Billings:

Our conference upon the needs of Greater New York for Branch Libraries to reach the masses of the people in every district has convinced me of the wisdom of your plans.

Sixty-five branches strike one at first as a very large order, but as other cities have found one necessary for every sixty or seventy thousand of population, the number is not excessive.

You estimate the average cost of these libraries at, say $80,000 each, being $5,200,000 for all. If New York will furnish sites for these branches for the special benefit of the

masses of the people, as it has done for the Central Library, and also agree in satisfactory form to provide for their maintenance as built, I should esteem it a rare privilege to be permitted to furnish the money as needed for the buildings, say, $5,200,000. Sixty-five libraries at one stroke probably breaks the record, but this is the day of big operations and New York is soon to be the biggest of cities.

Very truly yours,

(Signed) Andrew Carnegie.

On April 26, 1901, the Legislature of the State of New York passed an act authorizing the city authorities to acquire sites for free branch public libraries, to enter into contracts with Mr. Carnegie or his representatives for the erection and equipment of the separate library buildings, and to provide for the maintenance of all the free public libraries attached to the Central Library. This agreement was signed by the Mayor of New York, Mr. Robert A. Van Wyck and by Mr. John Bigelow, President of the New York Public Library. As the boroughs of Brooklyn and Queens were not willing to have their share of the original sixty-five branch buildings erected and administered by the New York Public Library, the selection of architects, constructive and administrative details in this case were left to the Brooklyn Public Library and the Queens Borough Library, respectively. On November 7th, general agreement relative to the construction of free library buildings in the boroughs of Manhattan, Bronx, and Richmond was entered into with the architects, Babb, Cook & Willard, Carrère & Hastings, and McKim, Mead & White. By 1911, thirty-two of these branch libraries had been completed and opened to the public, and at present there are in operation forty-two branch libraries, thirty-seven of which have been erected for Manhattan, the Bronx, and Richmond from the funds provided by Mr. Carnegie.

LETTERS TO MRS. BILLINGS

Windsor Hotel, Montreal, June 9, 1900. There are about 400 librarians here and probably there never were so many people together so thoroughly satisfied with their own knowledge.

August 7. I have just had an interview with an elderly, thin lady in black, who declined to give her name. She wanted instructions as to how to word a clause in her will to leave a small sum of money to increase the musical collection at the Lenox, and went away quite decided to do it.

November 7. Yesterday morning, after voting, I went with Mr. Cadwalader to Yonkers, from which place we walked to the Schuyler's (5 miles) and got lunch. I came back to dinner with John and K. and at nine P.M. we went up to Madison Square and thence up Broadway to see the election bulletins. It was an enormous crowd, very noisy, but well behaved. You should have seen M.—the dignified one—with K. marching along, blowing tin horns with which John had provided them, and being pushed out of the way of cabs and street cars in the most unceremonious way. This morning the paper is very interesting and it is delightful to know that the country is safe.

January 18, 1901. This morning I was at the Bruce Library (42d St. and 7th Avenue) at 9 o'clock to meet some of the new librarians and get things started there. . . . To-morrow Mr. Putnam, of the Congressional Library, will lunch with me, and I have three libraries to visit. Also, I have to go and try to beg off from serving on the grand jury. So you see I do not lack occupation.

January 30. It is snowing hard (6:50 P.M.) and may turn into a blizzard. We got the library plans approved to-day by the Board of Estimate, and an appropriation of $2,850,000 was made, so we have got past that sticking point at last.

February 10. Mr. Charles Stewart Smith is going to give the Library a large and valuable collection of Japanese coloured

prints, of which we will make an exhibit at the Lenox next month. I went with him to the Lenox to arrange the business yesterday morning. It was snowing. I went down on a crowded Madison Avenue car, and on the way, some dexterous thief stole my watch. I am sorry, but it was too fine a watch for a man in my station in life and a $5.00 watch will serve me just as well.

February 17. I am very sorry to hear of Dr. Busey's[1] death, but life has been a burden to him for the last two or three years, and I think he was glad to be done with it.

February 20. I am busy getting papers and reports together for the grand consolidation meeting next Monday, when the New York Public Library and the Free Circulating Library are to be finally mixed, new rules adopted, etc. I am also making some sketches for the location of furniture in the rooms of the new building. . . . I am making a collection of the London illustrated papers and some others relating to the Queen's funeral, and think it will make an interesting historical volume.

June 7. It has been quite "summery" here since you left. . . . I dined at the Century Wednesday and Thursday, and found about twenty other men like myself, abandoned by wife and children for the summer. One of them said, as I came in, "Here's Dr. Billings. Summer has come, sure!"

June 22. I have to give a lecture on vital statistics next Saturday and am closing up the Library business for the fiscal year, which ends June 30, so that I am busy; and I am glad it is so, for it would be rather lonely here if I did not have plenty of work.

July 20. Cadwalader is better, not out of danger by any means, and John feels cheerful over his prospects. Mitchell

[1] Dr. Samuel C. Busey, a worthy practitioner of the old school in Washington, D. C.

proposes to take him to Bar Harbour when he is strong—say in about two weeks—and Pierpont Morgan has offered the use of his yacht, the *Corsair*, for this purpose.

R. M. S. *Teutonic*, August 1. Wednesday morning I got to my office early, found many things to be attended to, but finally got on board feeling very much used up. . . .

Grand Hotel, London, August 9. There does not seem to be one of my old friends in London and I am almost reduced to sightseeing, to pass the time until I finish what little business I have here. . . . To-day, I have poked around among the book shops, and went from St. Paul's to the Marble Arch in the "tup'ny tube," which is the deep underground railway and is certainly well worth seeing. You go down in a "lift" about 60 feet to get to it. The cars are exactly like those on the elevated R.R. in N. Y. and the fare is two pence, no matter where you go, which is like our five cent fare. The engines are electric and the whole thing is well ventilated. . . . I got a note from Weir Mitchell this morning in which he says, "If pernickity crossness be a sign of returning health, he ought to be soon well." From which I infer that Cadwalader is making things lively for them. . . . As yet I have not found any new books, and there is no news in the newspapers, except comments on the closing scenes in Parliament, which is just finishing the appropriation bills so that the members can get to the grouse moors by next Monday, which is the twelfth of August, when the shooting begins.

TO MISS ACLAND (OXFORD)

September 5, 1901. I had an interesting trip to Scotland—spent several days with Mr. Carnegie, at what is known as Skibo Castle, not far from Dornoch, on Dornoch Firth. Was duly awakened every morning at seven thirty by the bagpipes played under my window, and marched solemnly into dinner every evening to the strains of the same ferocious instrument. . . . From Skibo I went to a moor in Forfarshire, near Edzell, where several of my New York friends were having a

good time shooting grouse. The scenery was fine, the weather the same, and I tramped about, getting thoroughly tired and exceedingly hungry as I followed the sportsmen and watched the shooting of each man with a critically ignorant eye.

TO MRS. BILLINGS

New York, April 12, 1902. We had the staff meeting at the Astor last evening. I shall get to Washington Monday evening just in time for a committee meeting, which will probably last until 10:30 P.M. Most of my time seems to be spent in committee meetings or in getting ready for them. I have just finished one which lasted two hours, and in ten minutes am going to another.

June 9. The city authorities have given us three sites, one on East Broadway, one on Amsterdam Avenue near 69th, and one in the Bronx—140th Street. I hope to get a meeting of the Special Committee to-morrow evening, and get at least one more site.

July 1, 1902. To-morrow afternoon is the formal opening of the new library at Irvington, with my pupil, Miss Townsend, as librarian. I shall go up, if I can, and then go to the Schuyler's. It is called the "Guiteau Library." I should want to change the name if I were there. I read *Scarlet and Hyssop* on my way down. If that is anything like a fair picture of English higher society, it is very bad. I don't know many women or much about them, but I never met anyone like the women Benson describes.

July 7. You are right in saying that I have not much sporting blood. I have never seen a horse race or a prize fight, and don't feel any wish to see one nowadays. Plenty of books and papers is the only essential for me.

July 21. My visit to Woods Hole was a good thing. I explained the Carnegie proposition to several of the trustees. They had a meeting on Saturday, and I have just received a

telegram saying that the proposition is unanimously accepted, so that the Carnegie trustees will have at least one thing settled when they meet.

July 23. I have received from the Census Office Mr. King's two volumes on vital statistics, about which I promised Mr. Merriam to write something. It is going to be a difficult piece of work for me, for I have not thought about such subjects for several years, but it must be done somehow. . . . I am glad that O'Reilly is to be the next Surgeon-General—in September.

August 6. The *Higher Cult* is stuff and nonsense—a mixture of theosophy, Christian Science, etc. Have nothing to do with them.

August 12. Yesterday, Carrère, Hastings and myself had a little private cornerstone laying, setting the first block of marble on the new building on the N. W. corner. I took the trowel, spread the bed of mortar a little, Hastings dropped a new ten cent piece (1902) into it, down came the stone, I tapped it three times with a hammer and said—"May this building be all that the builders, the architects, the trustees, and the people of New York hope and expect." The formal cornerstone laying will occur in the fall, but we have got block No. 1 into place, and by the time you return, I hope there will be quite a little line of wall for you to see.

Bar Harbor, August 24. Mitchell is very well and much interested in something he is writing about Braddock's defeat. I don't know whether it is a story or not, but he has a dozen volumes of history and biography, which he consults frequently, and the long rainy day yesterday suited him exactly —he must have written for at least six hours.

October 10. At the Library Club yesterday afternoon, the disinfection of books was the main subject, and the experiments I had made with formalin while we were in Philadelphia, were the main facts produced.

June 5, 1903. Got 1200 volumes for the Century[1] from Stoddard's legacy, but nothing of any special value. Still I will show them to-morrow at the monthly meeting. I think Mr. Stedman took the best of the poetry.

June 12. I have finished the first part of my work on plans and specifications for book stacks and shelving, and have turned it over to the copyists. Now I am considering lists of over ten thousand modern books in English, in all departments of knowledge, and marking the 5000 that I think would be best suited for stocking a circulating library. It is interesting but fatiguing work, and after an hour of it, I find it absolutely necessary to turn to something else. Our report on the drink question for the Committee of Fifty is out at last—in two volumes. This morning the only thing talked about is the killing of the King and Queen of Servia, the general opinion seeming to be that they deserve it. Everything in the Library about Servia is being called for.

June 25. Dr. Folsom came in last evening. He is full of enthusiasm about the new Harvard Medical School, with its Hospital, which is to be the finest in the world.

June 29. I have an urgent letter from Mr. Putnam of the Library of Congress, desiring me to be chairman of an important committee and to agree to be at the meeting of the British Library Association at Leeds on September 7.

Hôtel Bristol, Paris, July 28. The International Bibliographical Institute in Brussels has a card catalogue about twice as big as the card catalogue of the Astor Library, but no books. They expect people to write to them asking for the titles of all books on a particular subject and pay for having the list copied, and then the writer is to find the books as best he can. I don't think it will be used enough to pay for the expense of keeping it up. . . . I expect to get to Naples a week from to-morrow. . . . I hope to see Vesuvius in eruption, but this morning's Paris *Herald* says the eruption is dying out.

[1] The Century Club.

August 1. I had a very pleasant and instructive hour with the Curies (Professor and Madame Curie) in their Laboratory, where they showed me some curious effects of radium. They had heard that radium had been discovered in a mine in the U. S., and were anxious to know about it, but I could tell them nothing.

Hotel Royal Danielli, Venice. August 9. I was made happy last night by the receipt of your two letters of August 3d, which assured me of your safe arrival at St. Briac. With them came one from President Eliot of Harvard, requesting me to serve on a committee to advise as to what is to be done about the Library of the University. . . . I spent considerable time yesterday in the Royal Library of St. Mark. The librarian was very courteous, showed me some curious old books, and we arranged for a system of exchange of duplicates which I hope will result in something. To-morrow I go to the Castello di Brazza, in the mountains near Udine.

Castello di Brazza. August 11. This is a queer place, about a thousand years old. Count di Brazza is very proud of his family records and showed me this morning some manuscript accounts and grants dating from 1325. The old stone castle is mostly in ruins, but the house in which they live is a large rambling place about 600 years old and is crammed with antiquities and curiosities of all sorts. It would take a week to look at them all. The Countess di Brazza was a Miss Day of New Orleans. She is very proud of her husband and his family, but her main interest seems to be in organizing schools for teaching the peasant girls to make lace. She has nine of these going now, and I saw the work of some of them at the Province (or county) fair which is now going on at Udine, which is an hour's ride from here. On one side the place has a view for 30 miles over a flat plain looking toward the Adriatic, on the other side are the mountains about 10 miles away.

Baur au Lac, Zurich. August 17. I find notes here saying that two of the men I want to meet on Carnegie business will be here to-morrow, another one on Wednesday, and the Naples

professor, Dr. Dohrn, probably on Friday. Until I have seen some of these scientists, I cannot tell just what I shall do.

Zurich, August 19, 1903. This is the best place for me I have been in since I left England. I have had long walks and seen much of the people and things I wanted to see, and feel very well indeed. But I am tired of vacation. The most interesting thing here to me is Dr. Haviland Field's *Concilium Bibliographicum Zoölogicum* which is an index of all literature relating to zoölogy and palæontology made on cards, very much like the *Index Catalogue* of the Surgeon-General's Office, which has been taken as a sort of pattern. Dr. Field wants the Carnegie Institution to help him out, claiming that he is spending $2000 per year more than he gets and that he must stop if he don't get help. He employs three women indexers, a printer, and two boys. One of the women was very bright, reminding me of Miss Eger at the Astor, and greatly interested in having me see all the details of how she does her work. If the Institution were at Washington or in New York I should not hesitate about recommending it for a grant, but to subsidize it in Switzerland is a doubtful matter. But it is doing really first class work. I have also spent several hours in the great technical school for Switzerland which is located here, and which has especially fine laboratories. One building is devoted entirely to testing building materials as to strength, etc., with apparatus for testing stone, bricks, iron, wood, etc. Another thing here that has pleased me much is an office for public information maintained by the city. I have been there three times, the Director speaks several languages and is able to answer almost any question about any town or institution in Switzerland. There are all sorts of directories, reports of universities, statistics, etc. It has given me some ideas about such a bureau in the new Library, for New York.

August 22. I had a pleasant and instructive day at Berne. Kronecker[1] was very nice and went about with me everywhere

[1] Hugo Kronecker (1839–1914), late professor of physiology at the University of Berne.

—statistical bureaux, libraries, laboratories, etc. His wife and daughters were away. . . . I have now definitely learned that in no European laboratory is there any calorimeter as good as Atwater's, to keep a man in for a week. Gamgee and Kronecker agree on this, and Gamgee will fully describe the four which exist in Germany, Austria and Switzerland, so I feel satisfied with what I can report on this point. I can also make a good report about physical laboratories. . . . I think that Leeds will be a bore. It is something like Jersey City and I should certainly not go there if I did not have to. I expect to meet Herbert Putnam in London on the morning of September 5th and settle as to the form of invitation to be given to the British Library Association.

Hôtel Ville de Paris, Strassburg. August 25. I have spent the day in the University Library, in many respects the best arranged one I have seen in Europe. It has about 800,000 volumes, and some excellent ideas about catalogue room and delivery desk. I shall have to stay over here to-morrow, as Professor Ewald, one of the men I want to see, will not be here until to-morrow evening.

Strassburg, August 26. I have several official library letters, and have just approved a contract for building a branch library on Tompkins Square (near the Boys' Club) to cost $85,000.

Chartres, September 1, 1903. I am to meet His Majesty, the Prefect of the Seine, to-morrow, and hope to obtain from him, or through him, a good lot of documents for the Library.

New York, September 27. I have been busy with the bidders for book stacks for the new building and spent three hours yesterday morning in listening to their arguments and inspecting the models.

December 29. I have just come from the Board of Estimates and Apportionment. They rejected all the bids for stacks for the new building, and we have to advertise again. This sets us back three or four months, bless them!

January 1, 1904. The talk at the Club last night was all on the Chicago horror, and the general opinion is that no theatre in New York is any more free from such a danger than was the Iroquois. If there is any exception, it is the Metropolitan Opera House, but all agreed that a panic there would be most disastrous.

February 9. Yesterday and to-day have been very busy days and I have done good work. It is now practically settled that enough money will be provided, so that I shall not have to discharge anyone or reduce any salaries, and that is a great weight off my mind.

New York, March 16. I am just off to see Mr. Gregoor, one of my cataloguers, who has had apoplexy. He lives at Pelham, near New Rochelle, and it will take the whole afternoon to go and come.

March 23. I see that Mr. Cannon has introduced the Carnegie Institution charter bill in the House, but I have as yet received no word as to when I shall be wanted in Washington.

June 11. I am just off for Cold Spring Harbour, to receive the laboratory grounds from the Wawepex Club, and shall stay to-night, with Mr. Jones, the president. . . . I have got the data for my census report, and shall go at it next week. Yesterday, I took the ten millions in Carnegie bonds from J. P. Morgan's over to Hoboken, and deposited them in the Trust Company's vaults. I carried them in my little bag and felt very important, also very suspicious of every one who brushed against me. But no robber appeared.

June 16. In the horrible steamboat catastrophe yesterday, two of the women employed as cleaners for the Astor building were drowned. The little son of Mr. Alt, the engineer at the Astor, was on the boat and was saved. So you see we are all deeply interested. I do not see what excuse the officers of the boat can give, but we must wait for the results of investigation.

July 8. The city will not furnish any stock of books for new libraries until next year, owing to want of money, so that we shall not be able to open the three new libraries that will be finished by the end of August. It is a pity.

July 30. Father MacMahon did not come to see me yesterday, but sent me a little note saying that the Archbishop favours consolidation, so I suppose it is all right.

Banff, Canada. August 5. From New York to Buffalo I spent the time with Mr. Root in the smoking room, except an hour at lunch with the ladies. I was glad of the opportunity to talk over Carnegie matters with him, and he was very interesting in his talk about how they want him to run for Governor and how he does not want to do anything of the kind. . . . I had been told that there were beautiful mountain views to be seen this morning so I got up early, but a smoke haze hid everything that was more than 100 yards away, as there have been big fires in the woods for the last two days, and nothing but hazy dim outlines can be seen from the hotel.

Banff, August 9, 1904. This is no doubt a very beautiful place but it is not much more so than Onteora, and the views from the hotel are curiously like those from your cottage, the same twin peaks in one direction and the view up the valley in the other. The peaks are higher, that is nearly all the difference. It has been foggy and smoky all the time except for about two hours yesterday.

Victoria, B. C., August 14. I succeeded very well in Vancouver, and got a very nearly complete collection of the municipal documents, much more complete than the Vancouver Library has. If I can do as well here I shall be satisfied. I have just received a telegram from Mr. Lydenberg, announcing the death of Mr. Avery. He will be a great loss to the Library, and I am very sorry on my own account, for he was a good friend to me. At last the great naval battle has come off. I am curious to know what Captain Mahan will say about it.

. . . There have been great forest fires causing much smoke and haze, so that one can see nothing of the distant snow-capped mountains of which I have heard so much. I shall be glad to get back for I am tired of doing nothing.

August 21. Yesterday morning, there was a big snow and rain storm here which washed the smoke out of the air, and made it possible for the first time to see the distant mountains. It is certainly beautiful, but it is very dull, and I shall be glad to get on the home stretch to-morrow. I have not seen a newspaper for four days, so don't know whether Port Arthur has fallen or not, but it makes no difference.

September 16. I find I have been made chairman of a committee appointed by the Society of Army Surgeons to award a $100 prize for the best essay on the relation of the Medical Department to the health of armies, and seven long typewritten essays have been sent me to read. I shall try to read them on Sunday.

September 17. I have got my annual report about the Library in type, am going to give plans for six of the new branch libraries in it, which will be of some interest.

September 24. The models for the stacks on which bids are being made are being put up in the old Arsenal (64th Street and 5th Avenue) and we are to examine them on Monday morning. The bids range from $765,000 to $970,000.

October 8, 1904. I took Brunton over the Astor Library and then took him to Dr. Hamilton's and got home at six. When I went up into the Library, I found Dr. Clifford Allbutt, of Cambridge, reading the last number of *Punch* and very much at home.

Washington, March 16, 1905. Have spent most of the time at the Congressional Library and have secured a lot of things. . . . My lecture last night, at the Public Library here, went off very well and there was a good audience.

May 10. Cadwalader is still confined to bed, and I am to take his place to-night at a dinner which he is giving to the Whitelaw Reids, the Mayor, etc. I feel very important.

May 13. They have got the bill passed for a site for the Central Brooklyn Public Library, which is to cost about two millions of dollars.

TO MISS ACLAND

April 11, 1912. It is getting to be a huge machine at the central building. We are having more visitors and more readers than the British Museum or the Bibliothèque Nationale. Mere bigness, however, does not impress me much.

October 17, 1912. I cannot get away this winter. Probably I shall retire from library work next year. . . . If I live, and feel well enough and find it possible, I may take a long trip after I retire, going to Egypt, Greece, etc. which I have always wanted to see. Give my affectionate regards to your people who are also my people.

It will be gathered from the letters of Dr. Billings to his wife, which form a sort of diary of his experiences, that his avocations during these five years were as varied as of old. In addition to his gigantic labours upon the New York Public Library, he had taken upon himself other executive duties in connection with the Carnegie Institution of Washington, with which he became associated about the time Mr. Carnegie began to put his idea into practical shape. He was equally punctual at the annual meetings of the National Academy of Sciences at Washington, always paying a little visit of inspection to the Surgeon-General's Library on these occasions. As late as 1897, he made a report to the Memphis City Council upon the plans proposed for the new City Hospital there, his offhand discussion of which,

as taken down by the stenographer, is a remarkable piece of close reasoning.[1]

On December 2, 1905, he was engaged by the corporation of the proposed Peter Bent Brigham Hospital in Boston, to lay out, in connection with the land recently purchased, plans for suitable buildings, for a hospital to accommodate at least two hundred beds, a general scheme of organization, and details regarding its alliance with Harvard University. For many months he was at work over this and in frequent converse with those interested in the undertaking, in connection with which he visited all the larger European hospitals in the summer of 1907. His final recommendations were provisionally adopted, and, in collaboration with Professor F. W. Chandler of the Massachusetts Institute of Technology, he worked out the details of an architectural competition, serving as one of the committee of experts for selecting the plans. Upon this selection, and the subsequent choice of a firm of architects, he tendered his resignation on December 2, 1908. The Boston architects worked continually over the plans, under the supervision of Dr. Howard, the present superintendent, and the hospital was completed in due course in 1913. Billings also served on the Committee of Fifty, which, during 1893–1903 prepared an important series of investigations on the physiological aspects of the liquor problem, which were published in two volumes in 1903, and of which he helped to prepare a summary in 1905. He was one of the founders of the Charaka Club of New York City, devoted to the study of the history of medicine, and, in 1895, he presented an important and interesting paper on "The King's Touch for Scrofula," which shows a curious insight into views then novel, but now currently received, as to psychical effects of emotion

[1] For Dr. Billings's discussion of these plans, see *Memphis Med. Monthly*, 1897, xvii., 193; 249; 309.

on internal secretions of the ductless glands. In 1897, he made a historical report on "The Influence of the Smithsonian Institution upon the Development of Libraries, the Organization and Work of Societies, and the Publication of Scientific Literature in the United States"; and another report on "The Progress of Medicine in the Nineteenth Century," in 1901. In 1903, he addressed the graduating class of the Army Medical School at Washington on "The Military Medical Officer at the Opening of the Twentieth Century," a witty and engaging discourse; and, in connection with his library duties he was in constant request as a speaker in connection with the opening of the different branch libraries of the Carnegie Foundation and on similar occasions elsewhere. Of these may be mentioned his addresses to the New York Library Club (May 9, 1901) on "The Card Catalogue of a Great Public Library," giving the methods introduced by him in New York, the presidential address to the American Library Association (June 17, 1902) on "Some Library Problems of To-morrow," and his address at the opening of the new library building at Radcliffe College, Cambridge, on April 27, 1908. In this, the last important public address delivered by Dr. Billings, his audience was made up of women, and, although at this time, his spirits were beginning to flag, he shows his usual cleverness and *esprit* in adapting his subject to a gathering of ladies. He likens a library to a flower garden, a gymnasium in which the intellectual and emotional faculties may be exercised and trained, and to the flying carpet of the Arabian story as a means of overcoming the galling yoke of space and time. He comments humorously on the lack of a "browsing corner," in a women's library, on the lack of books on lace and tapestry in its catalogue, while, at the same time,

> the motive of Mrs. Toodles for buying a door-plate bearing the name of Brown because she (Mrs. Toodles) might have a

daughter, and that daughter might marry a man named Brown, "and then it would be so handy to have the door-plate in the house"

would seem to be "one that appeals to some professors as well as to some librarians." His final summary of the larger functions of a public library is characteristic:

In this library are gathered the most important records of the world's memory, of the progress of man from the days when Accad ruled the land between the rivers and the first dynasty was building in the valley of the Nile.

The dreams and hopes, the joys and sorrows, the sayings and doings of the wisest men of all times and all countries are gathered here, and it is from these that our teachers, our legislators and our people must draw the stores and weapons with which to contend with the same ignorance, indolence, folly and vice which have led to the downfall of the cities and kingdoms of long ago.

One other citation from this address of Billings may be given—a recollection of his youth:

When I was in college fifty years ago, the Library was not recognized as a part of the system of instruction. No professor ever referred the students to it, or suggested any use of the books in it. It contained about 15,000 volumes, and was open on Saturday mornings from 9 to 12. Each student could borrow two books, many of them did not borrow any, and I always found it easy to get half a dozen or more students to give me permission to borrow for them, so that I usually left with as many books as I could conveniently carry.

During the long summer vacations I used to make a burglarious entrance into the library by an attic trap-door, a climb over the roof, etc., and then I had long hours of enjoyment. I had no wise librarian to guide me—I simply tried every book on the shelves, skimming and skipping through the majority,

and really reading those which interested me, and if there had been a librarian there I should have carefully kept away.

In 1905, Drs. Billings, Weir Mitchell, and W. W. Keen were invited by the College of Physicians of Philadelphia to give some reminiscences of their experiences as army surgeons during the Civil War, which were printed in the transactions of the College for that year.

During the last years of his life, Billings made frequent but reluctant summer trips abroad, usually at the instance of his friend, Mr. Cadwalader, who liked to travel with him. In 1905, 1906, and 1908, the two friends sojourned at Carlsbad and Marienbad; in 1907, Billings made a tour of inspection of the principal hospitals of Great Britain and the Continent in connection with his plans for the Peter Bent Brigham Hospital; in 1909, he spent his summer vacation on the Pacific Coast; in 1910, he was in England and Holland. He took no vacation in 1911 on account of his interest in the new building of the New York Public Library, which was opened in the late spring of that year. During the summer of 1912, he did not leave the city, except to pass some time at Sharon, Connecticut, with his wife who was then in her last illness.

On Monday, November 11, 1902, at three o'clock, the corner-stone of the New York Public Library was laid, the principal speakers being Mr. John Bigelow, President of the Board of Trustees, and Honorable Seth Low, Mayor of the city of New York. In the course of his remarks, Mr. Bigelow said:

> I should fail of my duty if I did not here, on behalf of the board of trustees, publicly recognize our incalculable obligations to Dr. J. S. Billings, who seems to have been providentially sent to conduct the executive affairs of the new corporation. If the nature and extent of his services are best understood, as they naturally should be, by the trustees, they are, I

am persuaded, already generously appreciated by this community, among whom he first became a resident to oblige us.

Following Mr. Bigelow's remarks, the heavy stone, over seven feet long and weighing seven and one half tons, was swung into place, and the mayor, equipped with a silver trowel, pronounced it to be well and truly laid, after which he delivered a short address. In the stone had been deposited a number of public documents relating to the history of the New York Public Library and certain newspapers of the day. A short prayer by Archbishop Farley concluded the ceremonies.

On May 23, 1911, the new building of the New York Public Library was formally opened to the public, the ceremonies being held in the rotunda of the new building in the presence of an audience of about six hundred persons. The procession, headed by Dr. Billings and Mr. Edwin H. Anderson, the present Director, included Mr. Carnegie, Mr. Cadwalader, Mr. Rives, and the other trustees, Mr. Bigelow, Bishop Greer, and Archbishop Farley, the Mayor of the City (Mr. Gaynor), the Governor of the State of New York (Mr. Dix), and the President of the United States (Mr. Taft). After a prayer by Bishop Greer, Mr. George L. Rives delivered an historical address on the progress of the Library to date. Addresses by Mr. Stover, Mr. Gaynor, Mr. Bigelow, Mr. Dix, and Mr. Taft followed, the ceremonies concluding with a benediction by Archbishop Farley. This was followed by a public inspection of the building and a general reception attended by several thousand guests. On the following morning Wednesday, May 24th at nine o'clock, the building was thrown open to the public.

Through some oversight on the part of the President of the Board of Trustees, not a word was said about either Dr. Billings or Mr. Cadwalader during the entire pro-

ceedings of the dedication, thus omitting mention of the two men who had done most to make the Public Library what it is.

The new building as it stands is a rectangular structure in white marble, 390 x 270 feet in dimensions, the architecture in the style of the modern Renaissance, tending to the Louis Seize period, built around two interior courts, each about eighty feet square. The main façade of the building, with its marble columns, fronting on Fifth Avenue, is handsome. The interior finish is mainly of marble, with oak wainscoting in the office and reading rooms, and French walnut in the suite on the first floor (Fifth Avenue front). As in Dr. Billings's original plan the book stacks, seven stories high, are in the rear, the periodicals at the front of the first floor; the children's room, originally located on the main floor, is now on the basement or ground floor. An exhibition room for the display of rare treasures is also on the main floor, between the two courts. On the second floor front are the offices of the Director and Trustees, a lecture room, and the rooms devoted to the science collection. Along the sides of this floor are the cataloguing rooms and those devoted to public documents, economics, and sociology. Special study rooms and reading rooms for the Slavonic, Jewish, and Oriental collections occupy the central space between the courts. The main feature of the third floor is the large reading room, seating 768 persons and containing about thirty thousand freely accessible reference books, its location affording obvious advantages as to light, ventilation, and general quietude; the central public catalogue room, between the courts, lined as to its lower walls with six thousand catalogue trays, with the information desk in the centre. The sides of the third floor are devoted to American history, reserve books, and MSS., prints, music, photographs, and genealogy, while at the front are the

collections relating to art and architecture, the Stuart collection of rare curios, and a picture gallery. The basement floor has the lower strata of the book stacks at the rear, a shipping room, printing office, newspaper room, and children's room on the sides, a printing office, bindery, storage room, and library school class room at the front, while opposite the 42d Street entrance, filling the space of the north court, is a room for the circulating library for adults. The central space between the two courts contains a lecture room, the rest being devoted to the mechanical equipment. The entire Library accommodates over seventeen hundred readers, and its book stacks, with the other shelves, afford accommodation for about three million volumes.

In the *Century Magazine* for April, 1911, Dr. Billings published a description of the Library, his last contribution to literature, which may be consulted for further details. In this paper, he says,

> The scientific inquirer, the engineer and technologist, the patent attorney, the student of political science and economics, the investigator of early American history, the reader in Jewish history and literature, in Slavonic literature, or in Oriental literature, the musician, the genealogist, and the blind man will each find a special library for his use, contained in a separate room with an attendant.

He enlarges upon the value of its collections of American history, the strong point of this Library, its *Americana*, beginning with the letter of Columbus announcing the results of his first voyage; its manuscripts, prints and art collections, its collections of Irish and Jewish history and literature, naval history, dramatic literature, philosophy, folk-lore, and the history of religious sects. "The new building will have accommodation for 3,500,000 volumes," he concludes, "and it ought to possess this number within

twenty-five years." At the close of the year 1913, the Central Library contained 919,441 volumes and 307,868 pamphlets, making a total for the reference department of 1,227,309 pieces; while the forty-two branch libraries, including the thirty-seven erected out of the Carnegie fund, contained 964,189 volumes, making a grand total of 2,191,498 volumes and pamphlets in both departments.

As Mr. Anderson,[1] the present Director, has said,

> Dr. Billings was chiefly responsible for the plans of the central building. In a very real sense he was its creator. Always preferring to have things plain and simple, he was not greatly interested in the architectural style of the building, but rather accepted these as something which could hardly be avoided under the circumstances.

Few who came in contact with Dr. Billings were aware that this strong, forceful man had to cope with more than his share of the ills that flesh is heir to. During the last two decades of his life, he suffered from both the cancerous and the calculous diatheses, and was eight times on the surgeon's table, four of these being major operations. Between 1890 and 1892, he suffered from cancer of the lip, undergoing five operations for its removal, of which the last performed by Dr. William S. Halsted at Baltimore in 1892, was very severe and radical, involving extensive removal of glands of the neck. He kept the facts about these operations to himself, until the last one, when he told his son, stating that he did not expect it to be successful, and that he proposed to continue with his work until he "became a nuisance to those about him," when he would retire somewhere and wait till the end. The Halsted operation, however, proved successful. Professor Halsted himself relates that Billings grumbled over some

[1] In a letter to the writer.

painful phases of the after-treatment as "very poor surgery," but upon being informed that it was partly for experimental purposes, he cheerfully submitted to the pain and said no more about it. In the last four years of his life, he had two patches of cutaneous epithelioma which were successfully treated with radium by Dr. Abbe of New York. In his diary for 1900 is the entry: "February 5th. To Roosevelt Hospital. Operated on at four P.M. by Dr. McBurney for removal of biliary calculus," after which he seems to have been present at a dinner on February 16th. On November 27, 1906, there is a record of a cholecystectomy at the Presbyterian Hospital, and on February 24, 1908, "operated on by Dr. Brown" at the same hospital. I never heard him refer to any of these things, with the exception of a casual reference to a fracture of the ribs sustained in a fall occasioned by the jolting of a railroad car, which he mentioned in the jaunty manner he had in conversing with Dr. Fletcher. Of his fortitude and stoicism in the face of all these troubles we have the testimony of those who knew him well.

The following trait has been kindly furnished by President Eliot, of Harvard:

In October, 1896, I chanced to sit next to Dr. Billings in the old operating "theatre" of the Massachusetts General Hospital at the celebration of the fiftieth anniversary of the first public hospital operation in the world performed on a patient made unconscious by inhaling ether. Several addresses were made by eminent physicians and surgeons, and Dr. Weir Mitchell read his remarkable poem on *Pain*. At the close of the exercises the audience rose and slowly left the room, where the historic operation had been performed. As Dr. Billings and I were waiting for a chance to go out, I saw a gentleman of about Dr. Billings's age approaching us with some difficulty through the crowd and the somewhat displaced chairs. When Dr. Billings caught sight of this approaching eager face, his

own face lighted up very much, and both men stretched their arms toward each other before they were near enough to clasp hands. They shook hands with great cordiality, but in silence, and gazed at each other. The first words did not come from Dr. Billings; they were, "Any return, John?" spoken tenderly. Dr. Billings replied with the same gentleness, "Not yet, Fred." Whereupon they shook hands again with the utmost cordiality, and parted.

Then I understood with what heroic constancy Dr. Billings had already stuck to his work, though uncertain how soon a mortal disease would bring his working time to an end. In that uncertainty he went on performing vast labours for sixteen years more.

In his age as in his martial youth, he took his risks and endured his anxieties like a resolute soldier; and all the time accomplished great results through prodigious labours, guided by his keen intelligence and high purpose to be serviceable.

The following[1] is from one of Dr. Billings's most intimate friends, Sir Henry Burdett, of London:

Attacked by cancer many years ago, he twice underwent an operation without the knowledge of his wife, to whom he was devotedly attached, and came back again to his home, took up his ordinary work in so ordinary a manner that Mrs. Billings, one of the most delightful of women, never had an idea of the suffering and perils which he had gone through during what he denominated a short vacation. Later on, when he found himself attacked by a grievous internal trouble, for which orthodox treatment failed, he determined to place himself again in the hands of the surgeons, and was one of the first to undergo an internal operation of so dangerous and complicated a character that at that time few surgeons would undertake it. Each time he survived the operation, having a wonderful constitution, and returned to his work, which he was able to pursue with uninterrupted success until the day of

[1] Hospital, London, 1913, liii, 671.

his death. The sufferings and trials which John Billings endured, having regard to the value of his life and health to the generation which he served, belong to those mysteries which pass human comprehension. No doubt in God's mercy there was purpose in it all, for everything to a nature like his tended to make him a great character, full of the highest and noblest influence on every life which had the good fortune to come in contact with his own. We are conscious that a knowledge of what he had to suffer and of the spirit in which he bore it all has made it easier to some of his contemporaries to face peril or temptation, and if ever the temptation to shirk has come, his example has put fibre and manliness into many of us, and made us feel that whatever the cost, seeing what he did and how nobly he bore all his trials, we at least as his friends could not do less than our best always, though the heavens fall. The loss of such a life to his family and friends is irreparable, but it is a glorious and grateful fact to remember that John Billings was permitted to continue in harness to the end, though he was nearly seventy-five years of age. The loss of his wife last autumn was keenly felt. Writing afterwards he records that "the end came in a peaceful, quiet sleep. She saw all the children within two weeks before her death and was happy. I hope that in my finale I may be as patient and cheerful as she was."

The death of his wife on August 19, 1912, was indeed a severe blow to Dr. Billings, and he did not long survive her. A lady of rare personal charm, loved and respected by everyone who knew her, she had been the inspiration of his youth and the friend and adviser of his whole active life. Possessed of the happy gift of tactful sympathy she was able to smooth away any temporary ruffles or misunderstandings occasioned in others by his naturally imperious temper, and she is described by all who knew her as an ideal home maker and one who at times gave him material assistance in his work at home, which sometimes lasted far into the night. He once described how she

helped him in the preparation of the index of the five-volume *System of Surgery* which he had edited with Dr. Dennis of New York, the entire floor of a large room being papered with the different alphabetical entries. I remember seeing her on two occasions, once at her home, where, although a stranger, I was immediately set at ease and made welcome by her gracious friendliness of manner.

In 1913, Dr. Billings was again beset by his old enemy, calculus, this time in another locality, and he again went up for operation in March, under the care of Drs. John Rodgers and Frank Edgerton at the New York Hospital. Outwardly he gave no sign of any anticipation of serious results, with one exception. Dr. Weir Mitchell relates that he said:

"I am for the first time apprehensive." He went on to add: "It is a signal of age; and of late, as never before, any new project, any need for change in the affairs of the library, I find arouses in me an unreasonable mood of opposition. This too is, I know, a sure evidence of my being too old for my work. I shall, I think, resign my directorship of the library."[1]

Before leaving the Library for the last time, as if sensing the gravity of the situation, he went in to shake hands with his two associates, saying good-bye in a manner which was "most engagingly affectionate, fatherly, brotherly, sweet, if you can apply the word to a man so virile and masculine as Dr. Billings."[2] For the first two days, he did well, although suffering considerable pain, but pneumonia supervened and eventually proved fatal. Dr. Billings died on March 11, 1913.

His body was taken to Washington on March 13th, and after services at St. John's Church, Georgetown, was buried at Arlington Cemetery on the morning of Friday,

[1] S. Weir Mitchell, *Science*, N. Y., 1913, n. s., xxxviii., 832.

[2] Mr. H. M. Lydenberg (private letter).

March 14th. The casket, draped with the national flag, was borne to the cemetery on an artillery caisson and was lowered into the grave to the sound of taps, the pall-bearers being three artillery sergeants and three corporals. The honorary pall-bearers were Dr. S. Weir Mitchell; Dr. Charles D. Walcott, Secretary of the Smithsonian Institution; Hon. Elihu Root, United States Senator from New York; Dr. R. S. Woodward, President of the Carnegie Institution of Washington; Dr. W. S. Halsted of the Johns Hopkins University; Hon. John L. Cadwalader and Mr. Frederic R. Halsey, of the Library Trustees; and Mr. Edwin H. Anderson, Assistant Director of the New York Public Library. Six officers of the Medical Corps, United States Army, and seven members of the staff of the New York Public Library made up the rest of the escort.

Dr. Billings left five children, four daughters, Mary Clare, born November 9, 1863, who became the wife of Dr. William Wallis Ord on October 5, 1892; Kate Sherman, born October 23, 1866, married to William Hanna Wilson on November 26, 1891; Jessie Ingram, born October 23, 1866, who married Bradfield Hartley on September 3, 1890; Margaret Janeway, born November 4, 1872; and a son John Sedgwick Billings, born July 31, 1869, who is well known in connection with his work in the New York Health Department. Another child, born in 1865, died in infancy.

On April 25, 1913, a memorial meeting in honour of Dr. Billings was held in the Stuart Gallery of the New York Public Library, and was called to order by Mr. Cadwalader, President of the Board of Trustees. After a prayer by the Bishop of New York, Dr. Weir Mitchell gave an affectionate personal tribute to the memory of his dead friend; Sir William Osler spoke with discrimination of Billings's work in medical bibliography, Professor William H. Welch dealt with his work in hospital construction and

hygiene, Mr. Andrew Carnegie, Mr. Richard R. Bowker, and Mr. Cadwalader spoke of his human and personal characteristics, and letters from Senator Elihu Root and others were read.

Dr. Mitchell said in part:

We praise those who through years of work attain a high level of achievement in any direction. But this friend of whom I speak, a person of many competencies, lavished on his way through life opportunities for wealth and fame, any one of which would have tempted a man more eager than he for riches or more avid of renown. . . . My love and admiration for this man began early in the war, when my brother, a young surgeon, fell ill, and finally died. He was cared for with the utmost tenderness by the man whose death we now regret.

Professor Welch said:

He was a leader of the profession. His name and that of his intimate friend of many years, Dr. Weir Mitchell, whom we still delight to honour as the chief ornament of American medicine, were of all the physicians of this country the two best known in Europe. . . . His leadership was based upon intellectual power and above all upon strength and integrity of character. He was a singularly wise man, combining with far-sighted vision critical judgment, the gift of persuasion, and practical good sense. To an incredible capacity for work he joined a high sense of duty and a just appreciation and sympathy which secured the loyal devotion of his co-workers.

Mr. Carnegie said:

Knowledge is said to consist of two elements—what you yourself already know, and what you know how and where to obtain—of both departments our dear lost friend was master. Apart from his wonderful powers of the brain, his heart was tender, and many a tired o'er-laboured employee feels to-day he has lost a loving, tender friend. He was always just, always considerate. A man of both head and heart.

Friends, during his long, useful, pure and unwearied life he set all privileged to know him an example we shall do well to treasure and follow; for of him it can be truly said, he lived a kindly pure life above reproach, and by faithful administration of great tasks committed to him, surrounded by troops of friends, he left the world a little better than he found it.

Referring to Dr. Billings's work in the New York Public Library, Mr. Cadwalader said, in conclusion:

This stalwart, grave and somewhat distant man—stalwart in mind as he was in body—found at last the opportunity of concentrating his energy, learning and experience upon his final and perhaps his most attractive task in life.

How well he performed that office we well know. To attempt here to enumerate the successive steps is quite impossible. It is enough to say that he prepared the competition for the exterior, and with his own hands the plans of the interior arrangement of this building as it now exists. He organized the system by which the reference library was enlarged, catalogued and classified. He surrounded himself with a devoted staff, and he himself became the active living head. We caught the infection of his energy, and he would have been a poor soul who made no effort to trot on in the rear as he strode forward with gigantic steps. . . . As for myself, I buried in his grave at Arlington one of a rapidly narrowing circle of my dearest friends.

He had no enemies; he could have none in the atmosphere in which he moved. He had no enmities, although he did not "suffer fools gladly," and regarded with amused contempt humbugs and pretenders who posed before the public.

In fact, I fear the learned Doctor at times, and perhaps often, regarded boards of trustees, committees, architects and such like as obstacles cunningly interposed to retard his progress on the path of life.

It is a happiness to us to know that after a life of almost romantic achievements he was allowed to witness the com-

pletion of his final task in the establishment and successful administration of this system.

With all his varied powers and capacities we certainly shall not look upon his like again.

At a memorial meeting held at the Johns Hopkins Hospital on May 26, 1913,[1] Dr. Henry M. Hurd spoke of Dr. Billings's work on the Hospital, with many characteristic anecdotes. Colonel Walter D. McCaw described his military career, and said:

He undoubtedly had the making of a great soldier. He would have made a great general. He would have made a most able prime minister, and he would have had his own way. He would undoubtedly have made a great ruler, probably an easier position to fill.

Professor William S. Halsted said:

I shall never forget his words or his look as he said to me after I had been told of my appointment, "Now you have the ball at your feet, all you have to do is to kick it." I understood his friendly, almost fatherly smile to say, "I am not quite sure that I approve of you altogether but you may count upon my support." Since then he gave me many proofs that I had not misinterpreted his kindly glance.

Dr. Billings was too great a man to be fully appreciated in his time.

Professor Welch said:

Of all the men I have ever known, he was about the wisest. He was a man whose judgment you sought on any difficult subject, and you pinned your faith to him more than to any man of your acquaintance. He was wisest because he was under no illusions. He got at the heart and the essence of things. Dr. Osler says, The fame of bibliographers lives. . . .

[1] *Johns Hopkins Hosp. Bull.*, Baltimore, 1914, xxv., 244–253.

Dr. Billings was the greatest bibliographer in the history of medicine.

Mrs. Henry Draper, who died on December 8, 1914, and who was the widow of Henry Draper, Professor of Astronomy at Harvard University, established the John S. Billings Memorial Fund of $200,000 " in grateful recognition of the services and character of John S. Billings, lately Director of the Public Library," for the purchase of books, prints, and pamphlets for the Reference Department of the New York Public Library, each book to be marked to show that it was bought out of the John S. Billings Memorial Fund.

One of the most appreciative of his German admirers was the late Professor Franz von Winckel, the distinguished obstetrician of Munich, who, in 1887, wrote of Billings:

> The industry of this man is simply incredible, and any one who has seen him in his narrow workshop, surrounded by his many assistants, will be filled with admiration for this hero of our science.[1]

In 1890, von Winckel read a lecture entitled "J. Cornarius und J. Billings,"[2] in which he likened Billings, "*der Unermüdlichste der Unermüdlichen*," to Janus Cornarius, the great Renaissance commentator, who made the most accurate translations and commentaries of the greater Greek medical classics, and was at the same time an active practitioner and hygienist.

Some of the finest tributes to Billings after his death came from England. One of the best is from Mr. J. Y. W. MacAlister, Librarian of the Royal Society of Medicine:

> In Billings has passed away the kind of man who makes

[1] *München med. Wochenschr.*, 1887, xxxiv., 10.
[2] F. von Winckel, *Achtzehn Vorträge*, Wiesbaden, 1914, pp. 52–63.

epochs. He was a *great* man in every sense of the word. Big in body, big in mind, and almost superman in his power of work, he impressed all with whom he came in contact with the conviction that, whatever walk in life he chose, he would be easily first. He undertook tasks and carried them through, which ordinary men attempt only by means of committees, institutions, societies, coöperations, and a vast amount of fuss and noise. His plan was simplicity itself. If the thing was worth doing, he simply did it. I saw him once "resting" in the evening after a long and arduous official day. He was lying on a couch, almost hidden by two mountains of medical periodicals in every language, one on either side of him. He was slowly, but without pause, steadily working through the mountain on his right, marking the items to be indexed, and transferring each journal, as finished, to the mountain on his left. This was when he was, almost single-handed, producing month by month the *Index Medicus*, and the still greater task of the *Surgeon-General's Catalogue*—two pieces of work without which the rapid advance of medicine in the last thirty years would have been impossible.

I remember his saying to me once when I said something in praise of what he was doing, "I'll let you into the secret—there's nothing really difficult if you only *begin*—some people contemplate a task until it looms so big, it seems impossible, but I *just begin* and it gets done somehow. There would be no coral islands if the first bug sat down and began to wonder how the job was to be done."

He had done a big life's work when he was called to plan and administer the great New York Public Library, and he tackled it on his own principle—without fuss or unnecessary publicity; he just "began," and each day's herculean "chore" saw him miles on his way to triumphant success.

He was quite simply and sincerely modest, although this did not prevent an amused but quite magnanimous contempt for mere talkers. As an illustration of his modesty and simplicity (at the risk of appearing vain) I recall that when he was planning the New York Public Library, he sent me a copy of the plans with a detailed memorandum on the specification

with a request that I would "help him" (!) with criticisms or advice. I am prouder that *he* asked me this and prouder still that he thanked me for and adopted some humble suggestions than if I had been consulted by a Government.

His interests were as broad as his mind. One happy day I went with him and his lifelong friend, Justin Winsor, to Stratford-on-Avon. With us went Sam Timmins, the creator of the Memorial, and while Timmins did the honours of the place in his own inimitable way, Billings showed us—introduced us—to the *man*, Shakespeare. They might have been schoolmates, so vivid was the living imagination with which his slow, almost solemn periods discoursed of the living Shakespeare and his immortal creations.

Take him for all in all, Billings was a *man*, and *we* are not likely to look upon his like again.[1]

[1] *Brit. Med. Jour.*, London, 1913, i., 642.

CHAPTER VIII

SCIENTIFIC AND LITERARY WORK

DIEFFENBACH, the great master of plastic surgery, once said that the surgeon should have the many-sided Ulyssean temperament, full of native invention and resources, not to be found in books, and that, in consequence, all good surgeons should be clear thinkers, and therefore good writers. Billings was a surgeon of this type. In versatility, he was not unlike such men as John Hunter, Pirogoff, or Billroth. After a unique experience of four years, he gave up surgical practice at the close of the Civil War, after which his activities were as varied as those of any of the eminent characters just mentioned. During his official period in Washington, and after, he reminds us mostly of Haller, the versatile and learned Swiss, but with this difference, that Haller was a sedentary grind of the dressing-gown and slippers type, while Billings was, every day of his life, a man of affairs, keen for results of large practical moment, carrying all these forward along with his *Index Catalogue*, very much like a capable general pushing an army corps into action, with a vigilant eye on skirmish line, advance columns of troops, reserves, wagon trains, and commissariat. He worked incessantly and unsparingly and attained excellence in several different fields widely remote from his original calling. With the exception of Dr. Weir Mitchell, he was

in his day, and particularly in the eyes of Europe, the best known and most highly honoured American physician of his time. I have heard one or two enthusiastic Europeans refer to him as the greatest of American physicians, but from this judgment Billings himself would have been the first to dissent. He was not, in any sense, a pathologist or practitioner of internal medicine, and his standard of "greatness" may be estimated from one of his well-known utterances: "The John Hunter, or Virchow, of the United States has not yet given any sign of existence." Yet, with the single exception of Mitchell, he was certainly, in solid accomplishment and versatility, the most remarkable American physician of his period.

In attempting to estimate his position in the history of medicine, he must be judged in relation to his country, and it is safe to say that he did more to advance the status of American medicine than any other man of his time. Leaving out of the count his career in operative surgery, in which he did not work long enough to achieve eminence, we may establish this proposition by briefly considering what he did in his chosen fields of activity—medical bibliography, hospital construction, hygiene and sanitary engineering, vital and medical statistics, and the advancement of medical education and medical literature.

The work upon which Billings's name and fame most securely rests, what Osler styled his "float down to posterity," is the *Index Catalogue* of the Library of the Surgeon-General's Office. In medical bibliography, he had many others before him—Conrad Gesner, Merklin, Haller, Ploucquet, Young, Forbes, Atkinson, Callisen, Watts, Hain, Choulant, Haeser—but, as Osler has said, "their efforts are Lilliputian beside the Gargantuan undertaking of the Surgeon-General's Office"; for Billings was the first to catalogue and classify the entire literature of medicine in all its branches, and the magnitude of his work may be

estimated from the simple fact that, from the beginning of the nineteenth century, most medical papers of scientific importance have been buried in the files of periodicals. Haller, in the eighteenth century, achieved his admirable bibliographies of anatomy, physiology, botany, internal medicine, and surgery, complete summaries of the literature of these subjects to the date of his several publications; but, in Haller's day, there was little periodical literature to speak of, and this master of medicine, its greatest bibliographer before Billings, had the comparatively simple task of listing books, theses, and pamphlets. After Haller came the Danish surgeon Callisen, who made a complete author catalogue of the medical literature of the last half of the eighteenth century and the first third of the nineteenth, a wonderful performance for a single individual and supplementing Haller's work. Meanwhile, Boerhaave, Blumenbach, and Young in the eighteenth century had begun to catalogue special branches of medicine, in particular medical history, and, in the nineteenth, Ludwig Hain made his great repertory of the incunabula (1826–28); Ludwig Choulant catalogued the older medical classics, the graphic incunabula of anatomy and medicine, as also the literature of medical history; and Haeser, in 1862, made a capital bibliography of epidemic diseases which, with the *Additamenta* of Thierfelder, has been a standard source of reference to date. Billings's plan of making an *Index Catalogue* of authors and subjects in strict dictionary order gave physicians practicable access to everything of scientific value in medical literature, and it is no exaggeration to say that the wise have used it to eminent advantage. Enough has already been said to indicate the value of this work to the medical profession. The author bibliographies make it, as von Winckel said, the greatest of biographical dictionaries of physicians. The subject bibliographies made many investigations and the composi-

tion of many valuable books and papers possible which might not otherwise have been printed; and apart from this it is known that a very real improvement in the quality, not to mention the less praiseworthy increase in the quantity, of the medical literature of the United States, was apparent during and following its publication. The *Index Medicus*, the redaction of which was largely the work of Dr. Fletcher, gave the medical profession a monthly *Index Catalogue* of current medical literature, much of which is contained in hundreds of periodicals inaccessible to the average physician. Its continuance by the Carnegie Institution of Washington is a sufficient proof of its worth and value as a scientific tool. All in all, the *Index Catalogue* will immortalize the name of Billings so long as medical literature continues to be consulted by physicians and scientific investigators. At the memorial meeting in the Johns Hopkins Hospital, Professor Welch desired to place upon record his deliberate opinion that the *Index Catalogue* is the most important of American contributions to medical science in the nineteenth century.

During his career, Dr. Billings supervised the planning and administration of at least seven important structures —the Barnes Hospital (Soldiers' Home, D. C.), the Army Medical Museum, the Johns Hopkins Hospital, the Laboratory of Hygiene and the William Pepper Laboratory of Clinical Medicine in Philadelphia, the New York Public Library, and the Peter Bent Brigham Hospital in Boston. Of these, the great institution in Baltimore, acknowledged after its opening to be the best of its kind in the world, established his reputation as a hospital constructor. Other hospitals of larger size and more modern type have since appeared, but the opening of the Johns Hopkins Hospital made an epoch in hospital construction as well as in the advancement of American medicine, particularly of

medical education in this country. The name of Billings should always be remembered by the medical historians of the future in connection with this achievement.

For a period of about twenty years, Billings was regarded as the authority on public hygiene in the United States. Beginning with his report on the hygiene of the United States Army, his reputation in this field was established by progressive stages, moving from one strong position to another, and culminating in his appointment to the professorship of hygiene in the University of Pennsylvania. His addresses on state medicine before the American Public Health Association and other societies had great weight in their day, and while his efforts in behalf of a National Quarantine Service and of a sanitary survey of the United States did not come to fruition, they demonstrated his clear vision into the future and were the forerunners of real progress. He reorganized the Marine Hospital Service, played an important part in handling the yellow-fever epidemic at Memphis in 1879, was the author of important bibliographies on cholera (1875) and alcoholism (1894), many special reports on public hygiene and military medicine, a treatise on ventilation and heating (1884), which was republished in enlarged form (1893), and three separate treatises on hygiene, published in 1879, 1885, and 1893. During his whole official career, he was in constant request as an expert advisor in the sanitation of cities and buildings and as a sanitary and ventilating engineer. His official letter-books, which could not be quoted here, are full of careful and thoroughgoing responses to enquiries in these fields, made extempore, in the thick of harassing duties; and his published essays on such subjects as house drainage, yellow fever, quarantine, etc., show the extent of his practical knowledge. As a ventilating engineer, he was frequently called upon, for instance in the case of the hall of the

House of Representatives in the Capitol at Washington, (1876–78).

His treatise on *Ventilation and Heating* is an index of the intensely practical cast of his mind when applied to a theme of immediate and special importance. This work, originally written as a series of engaging "Letters to a Young Architect," contributed to the *Sanitary Engineer* was, in its first edition, designed to meet such demands as Billings had frequently encountered in his correspondence, and the treatment of the dry subject is made interesting through the writer's vigorous and straightforward handling of his theme and his clear humorous style of writing. The second edition, in the preface of which Billings duly acknowledges his indebtedness to the valuable assistance of Dr. A. C. Abbott, is more in the nature of a formal treatise. The subject matter is more than doubly enlarged, making it substantially a new work, with many examples and illustrations from recent practice, drawn from the periodicals of the time. It has a valuable historical chapter and contains everything of practical importance, including the many plans and elevations which Billings collected on his many European tours of inspection. While it has, of course, been superseded by works of more modern type, it was of great value in its day. Of the freshness and vivacity of the earlier edition a fair example is the concluding paragraph.

> The most wasteful of all expenditures for a public building is to provide an elaborate and costly apparatus for heating and ventilation, and then intrust it to the care of an ignorant and careless engineer, selected not on account of his knowledge of what is to be done and how to do it, but because he is "somebody's nephew," or is an "active politician," or is "unable to support his family."

Billings belonged, as has been said, to the older or philosophical school of hygienists of the Pettenkofer type, and the new school, which through the application of bacteriology, as Flexner says, "transformed hygiene from an empirical art into an experimental science," was just coming into vogue when Billings terminated his career in medicine. Although he had done good microscopical work in earlier days, he was in no sense of the term a bacteriologist. During his later period, he had become a public man of affairs, accustomed to shouldering large responsibilities and going after large results of immediate importance. For the minutiæ of intensive laboratory work in bacteriology he had neither aptitude nor inclination at this time. His career in hygiene cannot be judged from his Philadelphia period, which was interrupted by his appointment to the New York Public Library. Yet during this period, he put up two important laboratories, and the memoirs, turned out by his pupils during the short time of his actual incumbency, were among the most important contributions to the subject which have come from the institution which he directed.

Billings was an accomplished statist, well versed in the mathematical methods of Körösi, Rumsey, Farr, and the other writers before the time of Karl Pearson. From 1878 until 1912, he had taken an active interest in the national censuses. His extensive and accurate reports on the vital and medical statistics of the United States in connection with the census-taking of 1880, 1890, 1900, and 1910 are monumental achievements. In these reports, he employed the usual method of interpretation, applying statistical induction from the figures furnished him to establish new data as to racial equation and racial incidence in disease, and some of these results have been extensively quoted in the medical text-books. His Cartwright lectures on vital and medical statistics delivered before the College

of Physicians of New York in 1889, while not a formal treatise on the subject, attracted wide attention by reason of the valuable historical and numerical data and the keen practical sense everywhere displayed by the writer as he bores into the intricacies of his subject. In 1880, Dr. Billings suggested that the various statistical data of the living and the decedent "might be recorded on a single card or slip by punching small holes in it, and that these cards might then be assorted and counted by mechanical means according to any selected group of these perforations." This suggestion was taken up and applied by Mr. Herman Hollerith in the electrical counting and integrating machines which are now used by the United States Census.[1] The use of circles, with sectors variously coloured to represent the mortality of different races and communities or of racial incidence in disease, was also a favourite device of Billings.[2] With the new statistics of Karl Pearson, which employs advanced mathematics in the interpretation of correlations, Billings was not acquainted, but the concluding paragraphs of his Cartwright lectures show that he appreciated the fallacies and inadequacies of the older methods and that, like one gazing into the future, he had some insight into correlations:

In vital statistics, as in other branches of social science, it is not true that the effects of causes acting in combination are equal to the sum of the effects of each of the causes acting separately. Different causes of death having no relation to each other do not have a joint effect which is equal to the sum of the effects of each cause taken separately, and it is therefore difficult to bring the phenomena of vital statistics within the

[1] J. S. Billings, *Proc. Am. Assoc. Adv. Sc.*, 1891, Salem, 1892, xl., 407–409.

[2] For example, in the programme of Mrs. Henry Draper's reception to the National Academy of Sciences on November 18, 1896, among other scientific exhibits, there is the item: "Plates of vital statistics of the 28 great cities of the United States, by J. S. Billings."

boundaries of mathematical formulæ. In the doctrine of this kind of averages, time and number are not convertible terms.

Statistics apply to masses of men, to communities—not to individuals. We find a mass of matter moving in a certain direction with a certain velocity, and endeavour to calculate the direction and amount of the forces which have produced this result. In like manner we may consider the tendency to death in a community as a resultant of several forces as indicated in the diagram, and endeavour to estimate the influence of each of these forces in producing the result.

It is evident that we can know little of the influence which hygiene or therapeutics have had in shortening the line A B, if we know nothing of the length and direction of the other lines of force, and hence we must have the conclusions of vital statistics to make proper use of medical statistics.

In studying medical and vital statistics one is somewhat in the position of a man on the deck of a large Atlantic steamer out of sight of land and gazing on the troubled ocean. He sees many waves, large and small, apparently moving in every direction; and it is not until he has, by careful examination and repeated comparison, learned to distinguish the ripples due to the wind now blowing, the larger cross seas resulting from forces which were acting a few hours before, and the long, rolling swells which indicate to some extent the direction and force of the tempest of yesterday, that he can begin to understand the roll of the ship on which he stands; while to appreciate the force and direction of the great current which is sweeping with it all the troubled water and the ship itself, requires skilled observation with special instruments, and the use of charts which embody the experience of hundreds of voyages. So also in viewing the records of human life, disease, and death, the variations which are at first most perceptible are often those which are most superficial, and which give little or no indication of the magnitude and direction of the movement of the great masses beneath.

In acknowledgment of the value of his work in science, Dr. Billings received honorary degrees from the universi-

ties of Edinburgh (LL.D., 1884), Harvard (LL.D., 1886), Oxford (D.C.L., 1889), Munich (M.D., 1889), Dublin (M.D., 1892), Budapest (M.D., 1896), Yale (LL.D., 1901), and Johns Hopkins (LL.D., 1902), and was made an active or honorary member in many medical and scientific societies. On April 17, 1883, he was elected to membership in the National Academy of Sciences, his name having been proposed and passed upon in consideration of the value of his work on the *Index Catalogue*, and thereafter he played a prominent part in its transactions. He was elected treasurer of the Academy in 1887, serving until April, 1898, when he was obliged to resign the office on account of the pressure of his duties in New York. He was a member of the Council (1896–1907) and of various committees, such as that on publications (1888–99), and one of the trustees of the Barnard Medal Fund (1900–1908). During the last years of his life (1906–1912), he was particularly active on various committees dealing with the proposition of enlarging the scope of membership to include anthropologists, psychologists, philologists, etc. Billings presented several memoirs to the National Academy, in particular those on composite photographs of skulls (with Washington Matthews, 1885), and the researches made by his pupils in the Laboratory of Hygiene (1894–95), together with biographical memoirs of Joseph Janvier Woodward (1885), Spencer F. Baird (1889), and Francis A. Walker (1902). Of Baird, a man who, in respect of character, was very much like himself, he says:

> His remote ancestors were English, Scotch and German—an excellent combination both for business and science. . . . When Professor Baird was appointed Assistant Secretary [of the Smithsonian Institution], the immediate duty to which he was assigned was the charge of the library in the Department of Exchanges. . . . It was the possibility of creating a great

Museum of Natural History that induced him to come to the Smithsonian, and he never lost sight of this object. . . . He could not have what he wanted just then, but he had faith in the future, and meantime went on with his duties, which Mr. Marsh characterized as "answering of foolish letters, directing of packages to literary societies, reading of proof-sheets, and other mechanical operations pertaining unto the diffusion of knowledge." . . . For a time he threw all his energy into the organization and expansion of the Bureau of Exchanges, so much so that his friend, George P. Marsh, in some of his charming letters to him, half jokingly and half seriously remonstrates with him on his enthusiasm over the increasing number of boxes and packages sent out and received, the number of letters he was writing, etc., and expresses doubts and fears lest he should become a first-rate packing and shipping clerk. Professor Baird himself never shirked this mechanical drudgery, never publicly bewailed that he could not do just what he wanted to do, never smote his breast and rent his garments and called on the world to witness that he was a remarkable scientist, and that as such he ought to be made much of and be allowed to blow his own horn exclusively, even if he did receive pay for doing something else. . . . Of his capacity for organization and administration, the National Museum and the work of the Fish Commission are sufficient evidence. He had the full confidence of those very distrustful bodies of men, the Committees on Appropriations of the House and Senate, and while he never seemed to be urgent in his demands, he almost invariably obtained from Congress all that he desired. One reason for this was that he did not try to go too fast, and managed to educate public opinion so that the demands when made met with almost unanimous support. In fact, he offered suggestions rather than demands, and preferred to have others take up the suggestions and deal with them as if they were their own original ideas, while he remained quietly in the background, ready to furnish information when desired, but taking no apparent part in discussion or controversy, and absolutely indifferent as to who should have the credit, so long as the work was done. . . . With regard to

those not immediately connected with the institutions of which he had charge, he had grasped the open secret that one makes friends quite as much by asking and receiving as by giving, provided it be clear that the asking is not for personal benefit. . . . He did not like to read papers, or to take part in formal discussion, and, above all things, he hated the necessity of sitting still for two hours with nothing to do but listen to papers which, in the great majority of cases, had no relation to his work, under which circumstances he usually went to sleep. . . . He let his assistants work in their own way, ready to help or advise when called upon, but never fussily interfering or dictating minutiæ or methods; so that each one felt that to a great extent he was independent, and therefore, to a corresponding extent, responsible for good work and plenty of it, to which the constant example set by himself was a powerful stimulus. . . . He did not meddle with other people's business, and thus avoided one great source of hostility; and unless a matter was in some way actually or prospectively connected with the subjects in which he was interested he had no time to give to it.

Anyone who knew or saw much of Billings as a civil administrator will be reminded of him in the above characterization of a man with whom he was in such cordial sympathy.

On January 4, 1902, the Carnegie Institution of Washington was incorporated, and by a trust deed of Mr. Andrew Carnegie, of date January 28, 1902, acquired a fund of ten million dollars in registered five per cent. bonds of the United States Steel Corporation. To this fund, Mr. Carnegie added two million dollars in 1907, and ten million in 1911, making a total fund of twenty-two million dollars. The original incorporators of the Institution were Hon. John Hay, Secretary of State, Justice Edward D. White, Dr. Daniel C. Gilman, Dr. John S. Billings, Hon. Carroll D. Wright, and Dr. Charles D. Walcott. On January 29,

1902, the first meeting of the board of trustees was held, and Mr. Carnegie, in an address made on this occasion, recalled a conversation with Mr. Arthur Balfour in which he had noted the difficulty of finding men who can legislate for their own generation and inquired, "Have you ever seen or heard of a body of men wise enough to legislate for the next generation?" Mr. Balfour replied: "No, I never have," and "you are quite right; that is the wisest provision I have ever heard of in a trust deed." The officers elected to carry on this work were Daniel C. Gilman, President of the Institution, Abram S. Hewitt, Chairman of the Board of Trustees, Dr. Billings, Vice-Chairman, and Charles D. Walcott, Secretary. Among the trustees themselves were Dr. S. Weir Mitchell, Mr. Lyman J. Gage, Mr. Elihu Root, and others of note. Upon the death of Mr. Hewitt in December, 1903, Dr. Billings was continuously Chairman of the Board of Trustees until his death, and as a member of the Executive Committee, he served continuously from the date of its organization in January, 1902, to February, 1913. Of the sixteen meetings of the Board of Trustees held up to 1913, he is said to have missed only one, when under surgical treatment in 1906, and of ninety-nine meetings of the Executive Committee, he attended all but thirteen. In December, 1904, Dr. Gilman retired from the presidency of the Institution and he was succeeded in office by Professor Robert S. Woodward, who then held the chair of mathematical physics at Columbia University, New York.

President Woodward has kindly given the following reminiscences of Dr. Billings:

My acquaintance with Dr. Billings began one Saturday evening in December, 1884, at a meeting of the Philosophical Society of Washington held in the old Army Medical Museum and Library, located on 10th Street, N. W., Washington, D. C.

Dr. Billings was then President of that Society, and it happened on the occasion of meeting him that I was the first speaker in a symposium on the form and position of the sea level and especially on the distortions to which it has been subject by reason of alternations of glaciation in its polar regions. My desire to become acquainted with Bill ngs, roused on this occasion, was perhaps due to the trifling circumstance that he called conspicuous attention to the fact that I had been put down on the programme for a certain number of minutes (fifty as I recall) and that I had finished my part of the programme on the minute. It appeared that his military training as well as my own had appreciated the importance which should be attached to such time limitations in the programmes of learned societies.

From that time on until I left Washington in 1893 I saw Dr. Billings frequently, serving with him on committees, especially of the Philosophical Society, and taking counsel from him occasionally with regard to two matters in which we were both interested. The first of these related directly to the Philosophical Society before which some of the mathematicians of the day were apt to read long, dull and uninteresting papers, not because the latter lacked intrinsic merit but because they lacked proper presentation. Recognizing this fact clearly, Dr. Billings and several others of us interested in the matter sought to establish and soon succeeded in establishing the so-called "Mathematical Section" of the Philosophical Society. This enabled us to hold meetings for the presentation of deadly dull mathematical papers without taxing the patience of those not interested in such matters. Billings was a good counsellor in all such matters and helped to pave the way for this offshoot of the parent society.

The other matter referred to was that of the so-called Clerk Maxwell Club, which was organized by the late George E. Curtis and me in collaboration with eight or ten men here in Washington especially interested in the electro-magnetic theory of Maxwell. We formed a club which in its objects was very similar to the Mathematical Section referred to, and here again Billings, while not desiring to take

an active part in this work, was ready to give it a sort of fatherly encouragement.

After leaving Washington in 1893, about which time I believe Dr. Billings left also, I saw him less frequently until 1897. During August of that year I met him again very pleasantly at Toronto, Canada, during a meeting of the British Association for the Advancement of Science. We were each there two or three days at the meeting, and we happened to leave simultaneously on the same night train for New York. During this journey he inquired very graciously concerning my occupation as Professor of Mathematical Physics at Columbia University at which I had then been engaged about four years. We compared opinions also with regard to the scientific outlook confronting us in New York City, and naturally discussed many questions with reference to our national scientific societies from the National Academy of Sciences, down to the newest of the special societies then rapidly forming.

Two years later or thereabouts, when I was elected to the Presidency of the New York Academy of Sciences, I had again occasion to consult Dr. Billings with respect to the best disposition that could be made of the library of that Academy. It had then been in existence about eighty years and had been slowly accumulating a library chiefly through the medium of exchanges of publications with other learned societies. This library had grown to very considerable dimensions but had never been catalogued and rendered accessible except to a few curators who happened to see books as they were received. This library was at the time stored in the basement of Columbia University and in room much needed by that University. It was necessary, therefore, to do something even in opposition to most of the older members of the Academy. In solving this problem Billings was of great aid. We discussed several propositions and finally hit upon one which was accepted by the Academy. What pleased me most in my conferences with him was his keen appreciation of the fact that the library of a society is not of much good unless it can be bound up, catalogued and placed where it may be accessible to men who wish to use it. He agreed with me that prior to our times libraries

seemed to have been established chiefly for the benefit of librarians and bookbinders, and he gave me the most cordial assurance that if I would only persist it would be practicable to succeed in my project for rendering the library in question useful. It was finally deposited for ninety-nine years with the American Museum of Natural History on condition that this Museum should furnish to the Academy during the period of the agreement, free of charge, suitable rooms for holding its meetings, and on condition that the Museum would catalogue, bind up, and render accessible all of the works of the library. Owing largely to the alternative offered by Billings of finding some other equally effective disposition of the library I was able to accomplish the end attained and all members of the Academy now agree that this end was a happy one.

When the Carnegie Institution of Washington was founded in 1902, I became one of its confidential advisers soon after the preliminary organization was effected. This brought me into more frequent association with Billings, partly by correspondence and partly by personal interviews. Owing to an attack of fever which occurred in the summer and autumn of 1902 I withdrew temporarily from this relation to the Institution and the late Dr. George F. Barker, of the University of Pennsylvania, assumed the advisory position which I had occupied. A year later, however, owing to Dr. Barker's illness I resumed the advisory rôle referred to.

Still closer relations with Dr. Billings began in June, 1904. Somewhat to my surprise about June 15 of that year I received a letter from Dr. Billings of which a copy is given herewith:

40 Lafayette Place, New York,
June 13, '04.

My dear Professor Woodward:

I want half an hour's talk with you about some important matters connected with the Carnegie Institution of Washington.

Can you give me an appointment some day in the near future?

If you are to be in the vicinity of the Astor Library within a week, I should be glad to see you at any hour—I merely mention this because I have here some reports and papers to which we might wish to refer.

But if this is inconvenient to you I will come up to the University at any hour between 10 A.M. and 5 P.M. on any day you prefer.

My private telephone number is

4757 Spring (Astor Library).

Very sincerely yours,

J. S. BILLINGS.

It was generally known at the time that Dr. Gilman had resigned from the Presidency of the Institution, and it was likewise fairly well known that the Trustees were seeking a successor, so that although no mention is made of these facts in the above letter, it was tolerably clear what Billings desired. The above letter is here quoted verbatim to indicate the characteristic straightforwardness of Billings in coming at any matter of interest to him. In conformity with this characteristic he proceeded at once, when I appeared by appointment in his office a few days later, to tell me that he and several other members of the Board of Trustees desired me to stand as a candidate for the vacant position. He showed me also with the utmost frankness and fairness a copy of the proposed Constitution and By-Laws of the Institution and discussed with equally cool frankness the prospects of the situation in which he would like to have me placed. We discussed at length the merits (and defects as we saw them) of several other men, and I finally agreed to become a candidate on condition that I would not personally ask for or seek any influences openly or secretly to secure the position. . . .

With the beginning of 1905 I came into close association with Dr. Billings and had occasion at frequent intervals to consult him as Chairman of the Board of Trustees. For the work before us he was always ready. I recall not a single instance in which I desired to consult him of failure by reason either of his preoccupation or absence from his office. In the

despatch of business he had few equals. To a man constantly hard pressed for time it was a delight to meet him under such circumstances. He never delayed for a moment, going straight at the meat of the question before us, and it was always possible when I went to see him at his office in the Astor Library to secure the greatest expedition. To a surprising degree, while he could visualize the numerous details of any enterprise, he rarely permitted those to obscure the salient features. In numerous instances I had occasion to consult him concerning plans and specifications for buildings contemplated. Concerning the objects and general features of these he had in almost all cases previous knowledge; but it was remarkable that few engineers and few architects whom I have had the good fortune to meet could more quickly read a set of plans and specifications and hit upon the critical points to be considered.

He was similarly rapid, clear and effective as a member of the Executive Committee and more particularly as Chairman of the Board of Trustees. No one of his colleagues possessed so comprehensive a knowledge of the work, the history and the objects of the Institution. What was most surprising in his character to me was his unbounded confidence in the capacity of the Institution to execute any project which met his approval. Whatever its magnitude, and whatever the obvious difficulties to be expected in its execution, he was undaunted, being quite willing to undertake himself, single handed, any part of the work which might be delegated to him. Considering that he understood the number of difficulties and dangers which may beset any such enterprise much better than most men understood them, it appears to me extraordinary that he could enter upon them without the slightest evidence of misgivings on his own part. This striking characteristic of Billings helps to account, I think, for the extraordinary amount of work he accomplished. Occasionally he came into conflict with his colleagues in the Board of Trustees and this sometimes brought to the surface an apparently domineering characteristic; but in the end it always turned out, so far as my experience goes, that while he was a vigorous fighter and possibly sometimes hit below the belt, yet he was as serene in

defeat as he was in his triumphs. Over these latter he never gloated and over the former he never expressed regrets.

By many, perhaps most, of his friends Billings was held to be a rather cold-blooded personage. Naturally enough, to most of his friends there have never occurred opportunities in which the opposites of this trait could be manifested by him; but to the few people who had opportunities to know him more intimately he must have manifested, as he has to me, many evidences of those gentler properties which supplement our intellectual appreciation of him by a degree of affectionate regard rarely equalled among men. His attachment to his more intimate associates, like Dr. Mitchell, Mr. Cadwalader, and some others, disclosed him in lights quite different from those in which he commonly appeared. Without ever permitting his attentions to become obtrusive, the degree of solicitude he showed for his more intimate friends and associates was, in general, much greater than that he showed for himself, even during his evident decline during the past decade.

Another of the most striking characteristics of Dr. Billings was the entire absence of ostentation. He never sought to have any "advance agents" of prosperity; he never sought to tell his friends or the public what he intended to do. He waited until something was accomplished and then made a record of it equally without ostentation and equally without seeking in any wise to take credit for himself for any part he may have played in its accomplishment. In this respect he was a pure altruist, asking only opportunities for the accomplishment of good work for the benefit of his fellow man.

As Chairman of the Board of Trustees, Dr. Billings gave his strong support to several enterprises of importance. As a member of the Advisory Committee on Bibliography, one of the first things he urged was the revival of the *Index Medicus*, with Dr. Robert Fletcher as editor-in-chief in 1903. He was the strongest supporter of the projects of a Nutrition Laboratory (erected in Boston in 1907–8), the Solar Observatory (erected 1905–6), and the

Department of Meridian Astrometry. He introduced the resolution for the establishment of the Department of Historical Research and also furthered the cause of the Department of Experimental Evolution and the Index to State Documents. In regard to some other projects, such as that of the Geophysical Laboratory, Billings was inclined to be indurate in his opposition until he understood that the motives of their supporters were entirely disinterested, when he gave them his cordial aid. On the other hand he seemed singularly sympathetic in his attitude towards harmless would-be inventors and discoverers who had had no chance in life, not realizing for a long while that, in applied science, as President Woodward pointed out, the day of the genii from "the long grass and the tall timber" has gone by, and the trained specialist who can do the work required, if existent at all, is apt to be in full sight. President Woodward has elsewhere summed up this phase of Billings's work as follows:

> He was impatient with the verbosity and with the circuitous methods of obvious impostors, of whom the Institution has encountered not a few; but, on the other hand, he was wont to show great consideration to sincere but deluded enthusiasts, with whom the Institution has also had to deal in no inconsiderable numbers.
>
> The period during which Dr. Billings served the Institution has been one of swift growth, not unattended by difficulties and even dangers of a formidable character. It has been a period during which the Institution has evolved out of a chaos of conflicting opinions by aid of an unparalleled wealth of advice and suggestion and in the face of opportunities vastly greater than any single organization could possibly embrace. Among the essential qualifications of those charged with responsibilities under these conditions are a sense of humour and a sense of proportion. These Dr. Billings possessed in high degree. He was able to see readily that, while the Institution

might develop in any one of innumerable ways, it would be impossible to develop in all of these ways simultaneously. His grim humour, supplemented by his wide knowledge of men, led him quickly also to appreciate the inevitable impracticability, if not futility, of a large majority of the projects suggested to the Institution for applications of its income; and the same qualifications prevented him from entertaining any illusions as to the capacity of that income. He saw plainly that most of the worthy enterprises commended to the Institution not only may be more advantageously left for other agencies to develop, but that, by reason of the necessarily limited scope and income of any single organization, they must be so left. He stood firmly in opposition to all of the numerous plans suggested to the Institution for distribution of its income amongst educational, eleemosynary, governmental, and other organizations; and in opposition likewise to the still more numerous plans for dissipation of that income among a multitude of minor projects whose consummation could be better attained under other auspices. He thus rendered invaluable services during this formative period, when the Institution and its administration have been, properly enough in the interests of society, on trial, and when the only privilege it could claim was that of demonstrating a right to existence.

Of Billings's influence upon American medicine, which he did as much as any man of his time to develop towards a more dignified status, enough has been said in relation to the *Index Catalogue* and the *Johns Hopkins Hospital*. He was one of the prime movers in advanced medical education in this country, the Surgeon-General's Library, largely his creation, was the inspiration for the upbuilding of many other collections of value in different American cities, and through his lectures and writings on the history of medicine, he may be said to have given the original impetus to the present movement for its study and investigation in this country. His critical surveys of the status of American medicine in 1876 and 1886, although these

gave some offence at the time, displaced the old provincial standards and set certain severe norms of excellence which have made for good work ever since. All his occasional essays and addresses have the true historical perspective, and his *History of Surgery* (1895) is the best work on this subject in English. It is imbued with a genuinely critical spirit, and its use in the larger medical libraries, in which it has been put to scores of experimental tests, has revealed its unfailing accuracy as to facts and dates. Buried in one of those huge systems of surgery, which become obsolete every few years, it has not attracted the attention which it deserves, possibly also because Billings's mode of presenting his subject in this essay is not specially attractive. Speaking of it, he once said with characteristic modesty that he had only attempted to tell of the men he knew about; but, as was the fashion with Haeser, Baas, and the other medical historians of his time, he has presented, in some places, long lists of obscure or unimportant names, many of which are now forgotten. In consequence, there is a certain dryness, a lack of "give" to the style which is unusual in Billings. The introductory paragraphs are of particular interest, and the citations from old authors show the wide extent of his actual reading. Everywhere one has the impression that he speaks of nothing which has not been acquired by his own studies. There is no second-hand information. The paragraphs about John Hunter, James Wardrop, Dupuytren, Lisfranc, Civiale, Malgaigne, Nélaton, Lister, and Volkmann are admirable. There is humour in some of his critical digressions, although, as stated, Billings has submerged his usual breezy spirit by attempting to treat his subject *more bibliographico*. He is perhaps at his best in the concluding paragraph, which estimates the status of American surgery at the end of the nineteenth century.

In addition to anæsthesia, ovariotomy, and the foundation of modern gynæcology, American surgeons have contributed much to the art in the way of perfecting apparatus for the treatment of fractures by extension; of reduction of dislocations by manipulation; of the treatment of diseases of the hip and spine; of the ligation of large blood-vessels; of the removal of tumors; of the surgery of the brain, spinal cord, mouth, jaws, kidney, liver, and urinary organs. It is true that the scattered, unreported "first cases" of some of the great operations by early American physicians must be considered as entitling the individual to praise for his boldness or ingenuity rather than as "contributions to surgery," because it is not until such procedures have been made known to the profession and become a part of surgical literature or teaching that they have become useful; but from the beginning of the history of the art we find that the majority of the "first operations" of all kinds have been made, not by distinguished professors and famous authors, but by men who were neither teachers nor authors, and the names of many of whom are unknown to this day. This is true of amputations, lithotomy, herniotomy, trephining, excision of the breast, ligation of a wounded artery, Cæsarean section, hysterectomy, ovariotomy, and of the invention of many of the primitive forms of some of the most important instruments of the present day, "*Les petits prophets*," as Verneuil styles them, are worthy of all honour, and one of the objects of a history of surgery is to keep their names at least from being forgotten. American surgeons have contributed at least a fair share to the common stock of knowledge in the past, and it seems probable that they will do still more in the near future. They have been, for the most part, "practical men"; it is only within the last twenty years that the scientific problems of surgical pathology have been the subject of experiment and study in this country, but it is quite probable that the John Hunter or Joseph Lister of America is now busy with his preliminary work.

Once, in running over the university degrees he had received, the various LL.D.'s and D.C.L.'s, Dr. Billings

said laughingly to Dr. Weir Mitchell: "Yes, that is my principal title to be considered a man of letters." The statement was as modest and sincere as the man who made it. He would have been the last person in the world to regard himself as a literary man, in the sense in which Weir Mitchell or Oliver Wendell Holmes is so regarded. He wrote almost exclusively upon medical and scientific subjects, and the only excursions which he made into secular literature were a few slight sketches for the boys who read the *Youth's Companion*. Yet, if an anthology were to be made of the best things that have been written and said by eminent medical men in all ages, it is hard to see how the best things of Billings could be excluded from it. Unfortunately for lay readers, the wise utterances of great physicians on many aspects of life and nature are kept apart as something purely professional by the severe principle implied in the "Law" of Hippocrates: "Those things which are sacred are to be imparted only to sacred persons; and it is not lawful to impart them to the profane until they have been initiated into the mysteries of the science." Thousands who know *Rab* and *Marjorie Fleming*, *Under the Violets* and *The Autocrat*, *Hugh Wynne* and *West Ways*, or the greatest of all French dictionaries, have never even heard of the charming medical essays of John Brown, Holmes, Weir Mitchell, Emile Littré, or Osler, things which have in them not only a fund of inspiration for the young medical student but are valuable contributions to that "criticism of life" which Matthew Arnold thought the essence of creative and imaginative literature. None of these men, it is true, have attempted to write down to the level of popular comprehension, to cheapen their subject by vulgarizing it, and the writings of Billings are of an even severer cast than theirs. He was content to be read by such physicians as were interested in his view of things, and he would have

been as philosophical in resigning his writings to oblivion as Renan himself.

From the start, in his early youthful essay on epilepsy, Billings had made himself master of a literary style which was clear, precise, simple, and at the same time so flexible and effective that some of his old friends have wondered how he came by it. One answer is to be found in Goethe's observation that no one will ever know much of his own language who has not mastered some foreign language. More important still, no one, it may be predicted, will be a clear writer who is not a clear thinker to start with. Billings, an ambitious youth with an exceedingly well-regulated mind, dissatisfied with his rough country schooling, aspired to learn Latin, and in his school-boy struggles with a Latin valedictory we may trace those ponderings on the precise meaning of language and of grammatical construction which go to the formation of style as a mode of expression. In his army life in the field, he had much to do, as we have seen, with the composition of telegrams and general orders. This gave him an ideal once definitely expressed, that a literary composition should be as concise and precise as a telegram. Have something to say, say it, and having said it, give your paper a proper title and have done. Another ideal, frequently expressed in his statistical writings, was that, in science, facts are more desirable than opinions. In his larger essays or addresses, it was his habit to unroll a remarkable array of unique and interesting facts, and such opinions as he advanced were drawn from his actual experience with life, set off by effective quotations from the world's store of wisdom. An omnivorous reader, remembering everything of importance he had read, he was particularly fond of citing unique things from the Hebrew Scriptures, from Shakespeare, from Luther, and from those racial and racy proverbs which smack of the soil and are the fruit of actual experi-

ence. Traits like these gave to his best productions, such as his address at the London Congress in 1881 or his Ambarvalia with his old Cincinnati classmates, an immediate interest which was heightened by what Dr. Weir Mitchell has called his "air of easy competence" in public speaking. The mode of expression, clear, direct, and forcible, was simply the man himself.

In attempting to give some account of his skill in this regard, let us confine ourselves to "criticism of life" as the true function of literature.

One of his favourite problems is the challenge contained in Cain's question: "Am I my brother's keeper?" How far is the medical man to be influenced by purely altruistic sentiments? Were the weak and foolish made for the wise to take care of or shall we let them die in their tracks as Nature does? To this question, Billings has but one consistent answer, beginning with his view of the great hospital movement of the Middle Ages:

> When the medieval priest established in each great city of France a Hôtel Dieu, a place for God's hospitality, it was in the interests of charity, as he understood it, including both the helping of the sick poor and the affording to those who were neither sick nor poor an opportunity and a stimulus to help their fellow men; and doubtless the cause of humanity and religion was advanced more by the effect on the givers than on the receivers.

Coming down to present-day conditions in American cities, he says:

> In all large cities there exist a number of people who are very poor, who as a rule do not get enough to eat and are insufficiently clothed, and among these there is a distinct class of people who are structurally and almost necessarily idle, ignorant, intemperate, and more or less vicious, who are failures, or

the descendants of failures, and who for the most part belong to certain races.

These people congregate in certain quarters and in certain houses which are adapted to their means, tastes, and habits—they huddle together in foul rooms; they include the loafers, the street arabs, the tramps and casuals; their poverty is the result of intemperance and indolence dependent on physical structure, and if the evil results were confined to themselves there would be little use, from the commercial point of view, in attempting to improve their condition. If we consider them alone, we are tempted to say with Carlyle: "Let wastefulness, idleness and improvidence take the fate which God has appointed them, that their opposites may have a chance for their fate. He that will not work according to his faculty, let him perish according to his necessity."

But we must look after these people, and help them, for the sake of others, if not on their own account. When diphtheria prevails in a tenement-house many school children are in danger, and the most perfect plumbing in a house affords little protection against the entrance of this disease if it is prevailing in the vicinity. Typhus and smallpox do not confine their ravages to the vicious and foul after they have acquired malignancy amongst them.

Or again, in addressing the graduates of his *alma mater* in Cincinnati:

You have your health and strength, and knowledge; and by the possession of these you hope to win wealth and power, and, in so far as you obtain these, you will become the directors of the work and rewards of others, and it will be your duty to take care of the feeble, of the fools, and of those who have not had your opportunities, or, having had them have wasted them. I say "it will be your duty" to do this, not that "it will be your duty to get laws passed compelling other people to do it." *Gab es keine Narren, so gab es keine Weisen.* Moreover, the mere giving of money to people who say that they need it, in order to be rid of their importunities, is a very poor kind of

charity; sometimes it is mere paltering cowardice, as it was with many of those who contributed to feed and push forward Coxey's troop of ragamuffins.

It will be gathered from these sentences that Billings had no illusions as to the supposed efficacy of social or socialistic propaganda in which man is utilized as a political animal while still labouring under the handicap which Spinoza has signalized as the cause of all our troubles, "inadequate ideas." Having laboured all his life for the great ideal of a scientific organization of public opinion, Billings detested politics and politicians:

The small dealers in votes—the local bosses—the men who manage the primaries, often make great mistakes in the way they dispose of their property, for they do not see that they could get much more for it than they do, and they do not understand that for all the free drinks or small offices that they get they must pay the full share of the cost. The burden of the waste of the funds of a city does not fall exclusively, nor even mainly, upon capitalists, and property owners, but on the daily wage-earners, and this burden consists not only in higher prices for shelter and food, and in diminishing opportunities for work, but in sickness of themselves and of their families—in the loss of the health which is necessary to enable them to earn their subsistence. The man of means can give his children a chance to form sound bodies by giving them some months at least in the country every year; but the labourer's children must breathe the impure air of foul streets and alleys without ceasing. The healthfulness of a city is far more important to the poor than to the rich, but they never think of this in disposing of their votes.

Important advances in scientific discovery have usually been due to the rare intellectual courage of a few chosen spirits; but in order that these discoveries may avail for the greatest good of the greatest number, something more

than the individualism of politicians or political bodies is necessary. As armies travel upon their bellies, so financial resources have usually been the main coefficients in promoting hygienic or other social advances. The most effective warfare on tuberculosis, syphilis, alcoholism, typhoid fever, and other human ills did not spring from the people and their political demagogues but from institutions founded by wealthy governments or individuals. Although by no means without the Anglo-Saxon sense of the value of material resources, Billings had nothing of the current worship of wealth in and for itself. He regarded it as the essence of modern vulgarity. Yet neither was he in sympathy with the other extremists who vilify the rich man simply because he is rich. On this theme, he is deliciously ironical:

> I venture to express my sympathy for two classes of men who have in all ages been generally condemned and scorned by others, namely, rich men and those who want to be rich.
>
> I do not know that they need the sympathy, for our wealthy citizens appear to support with much equanimity the disapprobation with which they are visited by lecturers and writers—a condemnation which seems in all ages to have been bestowed on those who have by those who have not.
>
> So far as those who actually are rich are concerned, we may, I suppose, admit that a few of them—those who furnish the money to endow universities and professorships, to build laboratories, or to furnish in other ways the means of support to scientific men—are not wholly bad. Then, also, it is not always a man's own fault that he is rich; even a scientist may accidentally and against his will become rich.
>
> As to those who are not rich, but who wish to be rich, whose chief desire and object is to make money, either to avoid the necessity for further labour, or to secure their wives and children from want, or for the sake of power and desire to rule, I presume it is unsafe to try to offer any apologies for their existence. But when it is claimed for any class of men, scientists or

others, that they do not want these things it is well to remember the remarks made by old Sandy Mackay after he had heard a sermon on universal brotherhood: "And so the deevil's dead. Puir auld Nickie; and him so little appreciated, too. Every gowk laying his sins on auld Nick's back. But I'd no bury him until he began to smell a wee strong like. It's a grewsome thing is premature interment."

Aside from the cynical drollery in these lines, it is plain that, as between the Anglo-Saxon or Celtic, the Teutonic or the Slavic view of things, Billings had not the slightest hesitation in casting his sword into the balance. He believed in the Anglo-Saxon theory of life, that what we are, what we become, what we acquire in this world, our successes and our failures, are due to ourselves alone and not to any artificial social order, real or ideal. This is a constant note in his writings. He did not believe in despising and warring down the weak, but neither did he believe that temperamental weakness should be paraded as an excuse for not doing one's best. Addressing the Miami graduates, he says:

We hear more of this waste humanity nowadays than we used to do; not that the proportion has increased, but that it has been discovered, and more attention is given and called to it by the press, the politicians, and the professional philanthropists. The proportion of beggars, thieves, drunkards, and "ne'er do weels" was quite as great in mediæval cities, or in the cities of the last century, as it is to-day; but the average life of each was shorter. . . . Speaking from the statistical point of view, there is a chance that there is at least one here who is even now on the verge of taking the downward path, who will indulge his appetites until he ruins his arteries, who will become known as "nobody's enemy but himself," and who may curse the community with children in whom there shall be no health. Can this young man prevent this conversion of himself into refuse? It is possible, but he must do it now, for it will

probably be much more difficult, if not impossible, a month hence.

Now why should this kind of waste humanity be of interest to college graduates? Well,—one reason is that you have got to help support the people who compose it. Probably you are not paying much in the way of taxes just now; but all the same, for the support and care of these people you must help to pay; you must pay for what they use and destroy; for the police who look after them; for the criminal courts which try them; for their jails and prisons; for the hospitals which they fill, and for the cheap board coffins in which they finally do, perhaps, become of some little use.

This is hard saying, and to many who are familiar with the view that hardness of heart is no worse than softness of head it will seem but a wearisome iteration of the tendency of the fortunate to worship wealth and power at the expense of human misery. It is the frank view of one who preferred individualism to socialism and who, although associated all his life with military hierarchies and organized bodies, is said to have regarded "boards of trustees, committees, architects, and suchlike as obstacles cunningly interposed to retard his progress on the path of life." There were moments when he regarded an organized body, legislative or other, as, in Bismarck's phrase, "a great organized incapacity."

In regard to the advantages to be derived from the organized advancement of science, Billings is again cheerfully cynical:

This is a country and an age of hurry, and there seems to be a desire to rush scientific work as well as other things. One might suppose, from some of the literature on the subject, that the great object is to make discoveries as fast as possible; to get all the mathematical problems worked out; all the chemical combinations made; all the insects and plants properly labelled; all the bones and muscles of every animal figured

and described. From the point of view of the man of science there does not seem to be occasion for such haste. Suppose that every living thing were known, figured, and described. Would the naturalist be any happier? Those who wish to make use of the results of scientific investigation of course desire to hasten the work, and when they furnish the means we cannot object to their urgency. Moreover, there is certainly no occasion to fear that our stock of that peculiar form of bliss known as ignorance will be soon materially diminished.

Again:

As John Hunter once said in his rough style: "No man that wanted to be a great man ever was a great man"; and it is often the case that those who talk about the exceeding value, and loveliness, and importance of science, do not seem to think in a very scientific manner. Within the last ten years, I have had occasion to examine about two hundred essays and lectures written to prove that medicine is a science,—and each of them has rather weakened than strengthened my faith in the proposition. There is a Science of Physiology, and a fair commencement of Scientific Pathology and Therapeutics, and combining these we get, not precisely a Science of Medicine, but the scientific side of Medicine; that which deals with causation or prediction as regards disease."

And again:

No doubt the civilized part of the world is at present tending to increasing interference with the liberty of the individual for the real or supposed benefit of the community; but attempts to hasten this progress in advance of the education of the community, or without due consideration of the manifold social, commercial and professional, as well as the sanitary, interests involved are not likely to produce good results; on the contrary, it is probable that their remote effects may be the injury of the very cause which their enthusiastic advocates are trying to promote. You cannot legislate a new layer of cortical grey matter into, or a cirrhosed liver out of, a man.

It has been said that the car of progress has square wheels; at all events, it bumps horribly sometimes, and the results of going too fast may be very unpleasant, even if they are necessary.

Yet, in spite of his frank aversion to the modern spirit of collectivism, Billings shows his military training in other sentences which uphold the West Point idea, that no man is entitled to take a commanding position who does not know his place, who cannot do his duty in his own parallel of latitude or prove himself a thoroughbred in any given situation; or, as Stevenson put it, "The main thing for a soldier is to be silent and the chief of his virtues never to complain":

As a rule, men who indulge in personal vituperation of those whom they think are opposed to them are not good leaders or organizers, and those who most severely criticize the motives of others while boasting of their own morality are to be looked on with some skepticism, in accordance with what ought to be a Hebrew proverb, that those who make broad their phylacteries, and who seek front seats in the synagogue, do not make good bank cashiers. The great majority of us do not aspire to be leaders in any sense; we are willing to work in harness if it fits us decently, does not chafe or bind too tight, and, in a general way, is not made too perceptible.

Elsewhere he is humorously inclined to that conventional viewpoint of his race which English literature has made familiar to us:

In their brief journey of life through this world, the great majority of people must travel on the routes and by the vehicles provided for them by others, and, fortunately, they are usually content to do so. They move in groups which are "personally conducted," see the things they are told to see, try, with more or less success, to admire the things which they are told to admire, and their chief discomfort occurs when

their conductors are either silent or give contradictory orders, when it comes to the parting of the ways. Most travellers on an Atlantic steamer accept without murmuring the edict that "Passengers are not allowed on the bridge."

Again, he gives us a humorous presentation of the Anglo-Saxon view of ethics—"drawing a chalk line and making the other fellow toe it":

Our ancestors were restless, fighters, free-booters, and from these ancestors we have the common inheritance of energy; of what *we* call "firmness," and our opponents unreasonable, pig-headed stubbornness; of liking to manage our own affairs and, at the same time, to exercise a little judicious supervision over those of our neighbours; of hatred of humbug, and lying; and, in spite of our discontent, of a firm belief that our wives and children, habits, houses, mode of business, and of treating disease are, on the whole, better than those of any other people under the sun.

In voicing his own personal preferences, he sounds a more refreshing and less didactic note:

On this western continent our idea of desirable existence—of the life that is worth living—is by no means the Nirvana of the Far East, and though we may admit with the Bhagavad Gita, that "the sage in yoga is as a lamp in a windless place," we apply this only to the very old sages to whom the grasshopper has become a burden, and whose longing is for rest.

For most of us, motion and emotion, effort and exercise, are what make life pleasant, and if every one thought alike, and no one wanted what another man possessed, if there were no competitors or rivalry, this would be a very dull world indeed for young people.

Perhaps there is coming a future time when all that is now crooked shall be made straight, when every doctor shall have abundance of cases, all of which he can diagnose at once, and cure without delay, while at the same time the welfare of the

people shall be so advanced that there shall be no more sickness, and every one shall die in Euthanasia at the age of 100 or thereabouts; but I, for one, am glad to have seen the world as it now is, rather than to have known the millennium only.

Refreshing, too, is his response to a toast at the centennial dinner of the College of Physicians of Philadelphia (1887):

When Channa told Siddartha, the future Buddha, concerning the first dead man he had ever seen, that he "ate, drank, laughed, loved and lived, and liked life well," it was by no means high praise; yet it were well if it could be truly said of each of us, in addition to other praise. . . . What we all need to remember at this time, in this country, is the German proverb, "*Es müssen starke Beine sein, die glückliche Tage ertragen können*"—that is, "they must be strong legs that can support prosperous days." It is not my part to-night to advise, predict, or warn, even were I competent to do so; but I will venture to remind you that such an association as this can never safely rest and be satisfied for more than a week at a time. If it does, it soon becomes liable to comments similar to that made by a Wall Street broker on a certain rich church with a small congregation, viz.: "It is doing the smallest business on the largest capital of any concern in the State". . . . The individual members can do but little, and for but a little time. Pindar's melancholy remark that "Unequal is the fate of man; he can think of great things but is too ephemeral a creature to reach the brazen floored seat of the gods," is still applicable to most of us; but a society may remain and grow. Like those organisms which multiply by simple division or scission, somatic death is not a necessary termination for it.

Mere growth, or increase in numbers, however, is not what is desired; it is rather what the physiologists would call complete development and satisfactory metabolism that are needed.

In his monitions to young students or graduates, he is breezy, fresh, and forcible, speaking with the authority of

one who had made his own way in the world along the most rugged of paths:

Permit me to remind you why the hyrax has no tail. It is written in the mystic volume of St. Nicholas that when the world was about being completed notice was issued to all the beasts that, if they would go to the Court of the King on a certain day, they would be handsomely finished off with tails. All were pleased with the prospect, but the hyrax did not like to go out in bad weather. So he stood in his door and asked the lion and the wolf and several others to bring him his tail, and they all promised to attend to it. But they all forgot it; and when the hyrax went himself the next day to see about it, he found that the supply of tails was exhausted. That is why the hyrax has no tail, and if you rely on what other people tell you that they have done, or are going to do, for you, the result will probably be about the same.

Do not assume or affect a cynicism which belongs neither to your age nor your experience. Second-hand misanthropy is like a second-hand Chatham Street coat; it never fits.

The boy who believes that no woman is as good as his mother and that no man is stronger or knows more than his father, is a boy that I like immensely.

Don't indulge in too much introspection; beware of private theatricals. St. Simon Stylites on his pillar, or an East Indian Fakir contemplating himself, is not a good model for an American.

The public is not always sagacious, but in the long run it does somehow contrive to find out who are the skilled lawyers and doctors.

In an address delivered, late in life, to the graduating class at the Army Medical School in Washington (April 14, 1903), we find Billings at his best in this kind of writing.

His wit has the same edge as of old, there is the same lambent play of humour and the same gravity:

It is your duty to contribute your quota towards the social life of your post, and to try to make it cheerful and interesting. Of course, your personal likes and dislikes, strength or weakness, in such matters as athletics and games, shooting and whist, reading clubs and amateur theatricals, the nieces of the Major's wife, and other sources of amusement, will have much influence on your actions,—but be ready to give some of your time to things you don't care much about, if it is for the general good and pleasure. You have got to take into consideration the opinions, feelings and desires of some women as well as the men, but the only piece of advice I can give on this point is—whenever you find yourself thinking that you thoroughly understand the ladies,—or a lady—at your post, you had better not prophesy.

In one passage, we have the stern old army surgeon who had faced the fires of Chancellorsville and Gettysburg:

If it is true, and I think it is, that "a spice of danger and an element of chance add interest to work," then your work will have that interest. You are not coming on the stage of action at the beginning of a period of peace and content, but in the midst of a waxing tide of national struggles for commercial supremacy and of discontent among great masses of people. That this turmoil and unrest can be dealt with wisely and justly, so as to preserve that which is most desirable in civilization and in our system of representative government, I believe, but here and there in special localities, the immediate problems must probably be solved by blood and steel, and that you will have a part to play in some of these is not at all unlikely.

The best of Billings is in the grave and dignified close:

As members of a great profession, as officers of the nation, as citizens of a great country, as men possessing special knowledge and selected from many candidates, you are coming on the

stage of action to share the burden and responsibility of the world's work, to bring fresh blood and energy into the organism, to maintain and add to the dignity and honour of your corps and of your country. Enter upon your heritage modestly but confidently. Be strong and of good courage. *Nos morituri salutamus.*

His cheerful stoical philosophy of life is elsewhere summed up in the peroration of his London Address of 1881:

After stating that modern physicists have concluded that the sun is going out, that the earth is falling into the sun, and therefore that it and all things in it will be either fried or frozen, Professor Clifford concludes that "our interest lies so much with the past as may serve to guide our actions in the present, and with so much of the future as we may hope will be affected by our actions now. Beyond that we do not know and ought not to care. Does this seem to say let us eat and drink for to-morrow we die? Not so, but rather, let us take hands and help for this day we are alive together." To this I join a verse from the Talmud which will remind you of the first aphorism of Hippocrates, and is none the worse for that. "The day is short, and work is great,—the reward is also great and the master presses. It is not incumbent on thee to complete the work, but thou must not therefore cease from it."

It may be inferred that Billings's views on the questions of religion and the immortality of the soul were of a somewhat negative character. As with all strong and dignified natures, he was certainly reserved on these matters at all times and places. A devoted admirer of Stuart Mill, one wonders if he had ever read and pondered those impressive pages in the Autobiography in which Mill recounts the effect of his father's teaching. Physicians, at any rate, have a dubious reputation in this matter—*ubi tres medici, duo athei*—but where Hunter was indifferent, Huxley antago-

nistic and Helmholtz inscrutable, our author inclines to a view which might be described as safe and sane:

In the great majority of cases the special influence of the medical life of the present day is to broaden the views of the man who lives it, to make him independent in judgment—rather sceptical as to the occurrence of the millennium in the near future—quite incredulous as to the truth of the maxim that "all men are born free and equal"—more inclined to consider and perform the immediate evident duty of the day and hour which lies just before him than to reflections upon the errors of other men—free from morbid fear of death, and of that which comes after death—and none the less a believer in the existence of a Supreme Being and in the fundamental principles of religion although he may not consider them capable of scientific demonstration.

In another place, his views are such as might be acceptable to a mathematical physicist:

The old creeds are quivering; shifting; changing like the coloured flames on the surface of the Bessemer crucible. They are being analysed, and accounted for, and toned down, and explained, until many are doubting whether there is any solid substratum beneath; but the instinct which gave those creeds their influence is unchanged. . . . When we examine that wonderful series of wave marks which we call the spectrum we find, as we go downwards, that the vibrations become slower, the dark bands wider, until at last we reach a point where there seems to be no more movement; the blackness is continuous, the ray seems dead. Yet within this year Langley has found that a very long way lower down the pulsations again appear, and for, as it were, another spectrum; they never really ceased, but only changed in rhythm, requiring new apparatus or new senses to appreciate them. And it may well be that our human life is only a kind of lower spectrum, and that, beyond and above the broad black band which we call death, there are other modes of impulses—another spectrum—which registers

the ceaseless beats of waves from the great central fountain of force, the heart of the universe, in modes of existence of which we can but dimly dream.

Perhaps the most striking of all his utterances is the close of an address at the opening of the Laboratory of Hygiene of the University of Pennsylvania, a structure planned by himself. In this his thought takes a novel turn, allied to the mystic idea of Henry Vaughan, the Silurist poet, that such light as we have is but the shadow or reflection of God:

Those to whom we owe this Laboratory and its equipment and endowment, have been generous and wise in their generosity, which has been in accord with the teaching of the son of Sirach, "Having grace in the sight of every man living, and detained not for the dead."

Death comes by many paths to one or other of the three porches of the microcosm through which he enters, and brings his poppy flowers to all doors soon or late; but if we knew that which we might know, and did that which we might do, he would be preceded by fewer heralds of suffering, and would arrive only when we were ready to be "hushed in the infinite dusk."

If "ye shall know the truth, the truth shall set you free"—not free from change, or from grief, or from the final passage beyond the veil, but free from causeless fears, from unnecessary pain, from useless labour, and this is a part of that wisdom "which passeth and goeth through all things," and is "the brightness of the everlasting light, the unspotted mirror of the power of God."

CHAPTER IX

CHARACTER AND PERSONALITY

DR. BILLINGS, in the prime of his life, was a tall figure of powerful build and commanding appearance, with a handsome head, a straight, refined nose of the Napoleonic type, and clear open blue eyes. The whole man was in the strong, earnest look of those remarkable eyes, which, however dim they may have become in old age from long vigils of close night work, always retained something of the direct military glance, the background of sadness and isolation which we associate with the wide orbits of Bismarck.

The name Billings suggests at once his Scandinavian ancestry, and his middle name, Shaw, the Scottish element in his composition. He was of straight Massachusetts stock on both sides of his house, a Westerner carved out of New England granite. The different plies in his character were homogeneous and made for strength. A Norse Viking, with the blood of Scandinavian sea-fighters in his veins, the "defect of his qualities," if to be superbly strong is a defect, was an excess, not only of manliness, but of masculinity in his composition. He was a splendid example of *das rein Männliche*, and there does not appear to have been a trace of the brooding Celt in him. His jokes were, all of them, Anglo-Saxon jokes, chaffing the "under dog" with pleasant veiled irony, with no touch of

the Celtic whim of taking up the cudgels for the weak and unfortunate. Kind, courteous, just, considerate as he was, there was nothing in him of the womanish element which makes some men weak but attractive, nothing of the childlike traits, common to poets and artists, which made Weir Mitchell seem like Thackeray's Colonel Newcome, one "whose heart was as that of a little child." Yet he fascinated the discriminating everywhere by his unswerving honesty and reliability of character and by a certain cool detachment and isolation of mind which produced, externally at least, the impression of a distant manner. These traits will easily explain the antagonism which Billings encountered among those who did not understand him. Like his kinsmen, the Normans of old, "Nature's policemen," as Froude styled them, he deliberately imposed his will upon those with whom he came in contact, but with that forceful will there went a wonderful power to see things exactly as they are, in their right proportion, to "think straight and see clear," and to deal justly and fairly. The Berserk lurked in the background, but was veiled by a patient, thoughtful courtesy. One of the best of his English friends, Sir Lauder Brunton, thus describes him:

It is only when one meets with a man like the late Dr. Billings that it is possible to realize the meaning of the phrase "Rare Ben Jonson," for a combination of good qualities such as that possessed by Billings is so rare indeed that one only meets with a few examples of it in a lifetime. He was a splendid specimen of what Oliver Wendell Holmes in *Elsie Venner* calls "the Brahmin caste of New England." As his name shows, he was of Scandinavian ancestry, and he retained the overpowering strength and energy by which his Berserker forefathers carried everything before them. But he concealed them under such a quiet, unassuming, courtly exterior that those who had only a casual acquaintance with him could

hardly suspect the enormous latent energy he possessed. Though his learning was stupendous he never obtruded it, but, along with an easy flow of language, and a quiet vein of humour, it made him an excellent speaker and an agreeable companion, while his strong nature, affectionate disposition, and kindly ways rendered him at the same time beloved and trusted by those whom he honoured with his friendship.[1]

Considering the main elements in Billings's composition, one may note the affectionate loyalty to family and friends, the preference for quiet home life,—even (in his private letters) the tendency to sentimentalize over domestic joys and creature comforts, which characterizes the Englishman; on the other hand, the long memory for good or evil done him, the "statistical, memorizing habit,"[2] the grim humour, the "easy capacity for argument,"[3] the implied contempt for ineptitude, incompetence, or disloyalty, which are essentially Scottish; also, the strong dislike for vulgar pretence, vain show, and false insincere sentiment which is common to both races.

Even as a child, as his autobiography shows, he seems to have had the tendencies of the student and philosopher. Yet he was a man of affairs almost from boyhood up, spending his honourable youth as a soldier in the field, and more than half his life as a civil administrator of multifarious duties. The mainstays of his strength were his wife and his home. His private letters are full of a tender refined sentiment which he revealed to no one, recalling Emerson's phrase about "the sacred habit of an

[1] *Brit. Med. Jour.*, 1913, i., 643. [2] Henry James.

[3] Billings was not, however, disputatious. The algebraic phrase, as employed by Henry James, implies a "capacity" rather than an "intensity," in the sense of mathematical physics; not the "insanity of dialectics," but the tendency of the North Country people to meet assault of opposition with a prompt, ready answer, holding their facts well in hand for immediate use.

English wife." His domestic ideals were always "quiet living, strict kept measure," and without them, perhaps, he could never have accomplished what he did. Everything to be done, every public duty or private obligation was duly pigeon-holed in his mind, and all promises were faithfully kept and promptly performed. He worked, as Osler says, "easily, without fuss or effort," despatching everything with military promptitude, and except in hours of relaxation or vacation periods, when he threw himself into simple enjoyments with zest, he was accustomed to economize and give account to himself of every hour of his waking life. Hence those whose claims upon his time were impertinent or fraudulent were usually treated with an austerity of manner which was no doubt repelling. But with the sincere he was always sincere and whole hearted, and marvellous was the ease with which he disposed of the complex affairs with which he had to deal. His opinions were delivered with a remarkable, bold surety, downright and forthright, which sometimes produced the impression of "snap judgments," but he seldom went wrong. Few sentences went from his lips which did not wing the centre of the target or near it, and he never wasted words in business. Thus he came to be looked up to and sought after everywhere as that rare thing in modern life, an absolutely reliable man.

In his official life, he bound his co-workers and employees to himself, and set them an example, by this single trait of reliability, with all that it implies of honour and honesty and fair dealing. His ways were almost uniformly patient, quiet, businesslike, and when slight gusts of impatience or anger occurred, they were inevitably due, as his intimates knew, to the severe internal malady from which he suffered all his life. Where forceful action was necessary, as in dealing with pretentious or intrusive impostors, he sometimes employed the Napoleonic trait of simulating

anger, enjoying the humorous experience in the background of his mind. On one occasion, a certain physician of idle habits and meddlesome disposition, had taken it upon himself to haunt the laboratories of the Army Medical Museum, trifling with the delicate apparatus and offering irrelevant suggestions to the expert in charge, who seems to have made no effort to get rid of him. Suddenly, one day, the tall commanding figure of Billings appeared in the doorway, and, flashing his handsome blue eyes alternately at his assistant and the intruder, he vociferated with an apparent crescendo of anger: "This man, who loiters around these premises, tampering with valuable instruments, *who* is he and *what* is he?"—bringing the laboratory man up to a right notion of his duty and causing the meddler to slink away. On another occasion, he directed an official who had come on a self-imposed "tour of inspection," to go about his business. "I am the officer in charge here," he said, "and perfectly competent to attend to my own affairs." "Don't meddle with my men," was his watchword when, Wotan-like, he descended upon congressional committee rooms or departmental chambers in their behalf. This shows his feeling toward his men of whom he required only loyalty, competence, and honesty. Whatever of sternness went into his official dealings, such as whistling the incompetent down the wind, was simply due to the fact that he regarded his own relation to the government as a fiduciary relation, setting an example to all by his punctuality and his steady order of work. So long as men were punctual and reliable, he cared nothing whatever about their foibles and peculiarities. It was once objected to him that a certain foreigner in his employ had unfortunate periods of wild dissipation. "The man's work is valuable to me," he replied, "I cannot worry about his morals, poor devil!" On another occasion looking in at a door, he happened upon two of his younger

men engaged in wrestling at lunch hour, and patiently waited outside until they were through, thereupon transacting business as if nothing had happened. After briefly explaining his duties to a newcomer in office, he once said, with a kindly twinkle, "If your work is not found satisfactory, you will of course be—dropped." After the usual period of probation, he came into the employee's room, shook him warmly by the hand, and beaming kindly upon him said, "I am glad to say that everything is perfectly satisfactory and all right." On giving the same man a considerable promotion, he said, with playful irony, "Ever heard of the Cynic's Calendar? Then bear in mind this sentence, 'Many are called but few get up.'" This or something like it was Billings's way during his period of active service as a medical officer at the Army Medical Museum. I never knew him angry but once. This was in reference to a certain neurologist who shall be nameless, who had been dismissed from Billings's employ in the early seventies for incompetence. This man was given to the perpetration, not only of clinical reports "too good to be true," but to diatribes in which he claimed to have done the major part of the *Medical and Surgical History of the War* and to have originated the *Index Catalogue*, "*quorum pars magna fui*," as he put it, "*sed tulit alter honores.*" On being shown these things, Billings attained to white heat, not on account of the silly statements made but through his contempt for the unparalleled impudence. This little episode was the occasion of Fletcher's handsome tribute to Billings at the Philadelphia banquet in 1895.

When he came to the New York Public Library, Billings exchanged military for civil administration and had women in his employ. He adjusted himself to these relations with his usual adaptability, and, with no less of forceful character, became the suave New Yorker. Seeing his tremendous ardours of work and knowing his capacity

for concealing sheer physical suffering, his co-workers soon learned to love him, and to recognize, as age came on, that he had his "grey days" on which he naturally preferred to be alone and to himself. Near the end of his life, he once said to his present successor, Mr. Anderson, "I no longer have any enthusiasm. I have acquired a tendency to oppose new things and new ideas. I know it is wrong but I simply cannot help it." A large-minded man this, who could so clearly see the specific foible of old age. In like manner he was accustomed to say to Professor Walcott, his colleague at the Carnegie Institution, concerning the same *intransigeance*, "Walcott, I seem to oppose everything, don't I?" "No, Billings," was the reply, "you are not opposed to everything, but you are sometimes cross and intractable." Sometimes Dr. Weir Mitchell would quell these combative humours by laying his hand on his friend's shoulder with a playful "John, John." As Billings grew older, he seemed to lose nothing whatever of his force, but he acquired an added kindliness of manner, and there was about his face something of the spiritual serenity which all high minds have towards the approach of death. Even where he crossed his employees he did not fail of gaining their affections. To those who had known him in the earlier military period, there was added to this feeling an unusual sentiment of reverence and respect. The blue eyes, however dimmed by age, seemed still to retain their clarity and depth, the martial aspect abided, even though the expression was softened by time:

> And never poor beseeching glance
> Shamed that sculptured countenance.

To a portrait painter, who insisted that he keep his silvered hair long for an artistic effect, he exclaimed, "Why, you are trying to make me look like a pianist!"

The last time I ever saw him, he was sitting with Dr. Weir Mitchell at a lecture at the Carnegie Institution, very peaceful and serene: two beautiful old gentlemen, among the last of the noble line that helped to build up American medicine in the East, *par nobile fratrum*, one not destined long to survive the other.

The note which Billings introduced into American medicine was an exotic note, the Norman note. Other eminent men who did much for the improvement of medical education in this country employed different methods. Dr. Holmes relates that when Eliot began his radical reforms in medical teaching at Harvard, any protest or demurral was met by the cool deep-toned, bell-like response: "There is a new President." Pepper, in Philadelphia, as described by Osler, was sometimes Machiavellian in his adroitness of procedure. Any one who saw Billings in action will be reminded of "the love of strenuousness, clearness and rapidity," the "clear strenuous talent for affairs," not without a touch of "hardness," which Matthew Arnold defined as the characteristic trait of the Norman, and what is all this but an evolutionary phase of Emerson's Northmen?

> The gale that wrecked you on the sand,
> It helped my rowers to row;
> The storm is my best galley hand
> And drives me where I go.

Consider the bold, effective way in which Billings deliberately thrust the proper standards of higher medical teaching upon the Johns Hopkins Hospital trustees very much as the Normans in England induced the Saxon leeches to improve their training and become learned clerics. Could any ordinary man have said to these gentlemen, *à propos* of current hospital abuses, "In this

Hospital, I propose that we shall have nothing of the sort to fear"? What made this statement acceptable and effective was not mere force of character but the keen, clear vision, the detached sincerity of purpose behind it. In the mouth of an inferior man, such a sentence would have been hopelessly inept. Contrast it with Billings's directions to the writers of military reports: "Facts, not opinions, are wanted." At Memphis, in 1879, having collected his facts, he told the bluntest truths in regard to its sanitary condition and recommended the most radical reforms. Yet such was the effect of his personality upon these warm-hearted Southerners that they met him more than half-way in chaffing their own city, recognizing that this breezy, good-humoured, sagacious gentleman, who had come to help them out of their difficulties, was a natural born leader and ruler of men. In any affairs of moment, large or small, his rule was simply to make a good and brave beginning, leaving the rest to take care of itself. President Woodward once said that, in relation to the various scientific projects of the Carnegie Institution, Billings's courage was sublime. If any doubt were entertained as to the feasibility or viability of a given enterprise, the erection of a laboratory or observatory, the construction of a huge telescope or some unusual phase of experimentation, he would say: "Why, of course we can do it; why else are we here?" There is no doubt that a man with this talent for swift and accurate judgment could have made, as General Woodhull says, an irresistible advocate in legal procedure. It is equally true that, as an unrivalled civil administrator, he might have displayed the same military promptitude and precision in any phase of the larger life that came to his hand. On very rare occasions, he had cryptic humours, a trifle metallic, a rapier-like mode of expression, suggesting Lecky's observation that "strength of character is inseparable from hardness." At one important

function, his contribution to the festal speech-making was a rather long string of ironical "congratulations," a trait which recalls Napoleon at the ball, "proclaiming to all and sundry the solemn meteorological fact, *Il fait chaud*,"[1] or Beaconsfield praising a mediocre group of paintings for the high quality of "imagination." When seated beside prosy or loquacious persons at banquets, Billings was prone to relate Mr. Carnegie's story about the gilly and his lost Highland luggage—"The cork came out." He once told a lecturer that "No man living has the right to lecture people for more than two mortal hours." To a candidate for a minor chair in surgery, he said that he must perform more operations before his application could be considered. In like manner, he once declined to recommend a personal friend for a university presidency for the reason that he was "not competent to fill the position." Of a Sabbatical fellow-traveller in Europe, he wrote: "The next time he goes abroad, I hope he will take a clergyman with him!" In his Russian journal of 1881, he says: "Old Polish general tried to make me take upper berth. No go." Traits of dry humour such as these may have estranged some people, but, viewed aright, they rather indicate the impatient spirit of one whose mind had many amboceptors and who could not afford to fritter away his time with ineptitudes. In one of his private letters, Billings speaks of "the reputation of a rather cynical and selfish philosopher which many give me credit for"; but such selfishness was, in reality, what Balzac calls "the selfishness of the hard worker," the natural feeling of a man whose public activities were self-sacrificing rather than self-seeking, and who did not "suffer fools gladly." As Goethe said, *Die Meisterschaft gilt oft für Egoismus*. An old New England intimate, who saw less of him during his New York period, said that

[1] Varnhagen von Ense, cited by Carlyle.

Billings's attitude toward his friends recalled Goldsmith's lines about David Garrick:

> He cast off his friends like a huntsman his pack,
> For he knew when he pleased he could whistle them back.

But this, too, was an erroneous impression of a busy man absorbed in his work, when not overworked. His letters and journals show that any of his old friends, Chadwick, Wood, or others, who took the trouble to visit him in New York, were always given a cordial welcome. He never went back on any of his earlier Western friends, and to his *alma mater* and his classmates he gave his best. He was absolutely uninfluenced by petty snobbery. Any claim upon himself which was genuine and valid was always honoured. During his early life, he had to make part of his living by his pen, an army officer's pay being small, yet in reply to a friend's request for the loan of a large sum he wrote: "You are as welcome as the flowers in May." He declined to give an employee any assurance that he could protect him during successive changes of administration in Washington, yet he took care to do so, and even offered to help him by advancing money to pay for his house. He hated to write letters recommending individuals for places or promotions, because he regarded such things as ineffectual, but any promise made was always scrupulously kept as a sacred obligation. A rare judge of men and women, a keen reader of character, he took most pleasure in obliging those who struck him as deserving his confidence. Dr. Henry M. Hurd, of Baltimore, relates the following anecdote:

> I remember on one occasion he told me that he had been approached by an ignorant market woman with a letter in her hand which she was unable to read. She asked him to step aside into a secluded corner of the market in order that he

might read aloud to her a letter from a wayward son. He found upon reading it that the son was in prison and that his mother, fearing such to be the case, had not ventured to show the letter to any of her friends or acquaintances in the market, but had waited for a person in whom she felt she might have confidence that he would preserve her secret. She had selected Dr. Billings although an absolute stranger to read it because she saw from a single glance that he would be worthy of her confidence.

Of Billings's attitude toward women, General Woodhull writes:[1] "I think women would have liked him if he had given them the chance. He didn't." Doubtless while in harness, his intense absorption in his work may have given him somewhat the viewpoint of Wilkie Collins's Scotch baronet, who opined that women are entitled to our admiration and respect so long as they continue to deserve it. Moreover, his severe regard for the truth, his austere feeling for duty was such that he could not either be fascinated by beauty or dazzled by brilliancy. Nevertheless, there were women of high character who held him in esteem and felt honoured by his friendship. He lived on beautiful terms with his daughters and was much liked by English ladies. Dr. Fletcher once said: "Billings *is* an Englishman in character, but of course a Western man in his keen way of thinking." In general, Billings's feeling for the fair sex was that of a sincere friend or a kindly mentor. When his young daughter told him that some of his portraits resembled those of Bismarck, he replied: "You are a very wonderful little girl."

Miss Acland, daughter of the late Sir Henry Acland (Oxford), kindly gives the following reminiscences:

My first recollection of Dr. Billings was in 1876 when he came over to Europe with Dr. Ezra Hunt about the plans of the Johns Hopkins Hospital.

[1] In a private letter to the writer.

Dr. Hunt arrived in the evening tired and unwell and my dear mother, always anxious to make her visitors feel at home and to care for them, suggested that he should rest in bed. Dr. Billings arrived the next day whilst we were at our 8 o'clock breakfast, strong and vigorous, having stayed in London for a ball, went straight to the Paddington Station, and came down by the newspaper train. He arrived untired and ready for anything. . . .

From that day Dr. Billings was a valued and familiar guest in our house, when he "came home" as he used to say. His visits were always most eagerly looked forward to by my father. Dr. Billings's quiet and dignified manner, his unfailing sense of humour, combined with his clear and powerful intellect and great common sense, made him an ideal friend and companion.

When I was quite a girl and had a long illness, Dr. Gross of Philadelphia was most kind to me and lodged near me in London, coming in daily to see me. He then always called himself my American cousin. One day, I think in 1896, Dr. Billings was staying with us after Dr. Gross had died and we were talking of this. Dr. Billings said, "Is the post of American cousin still vacant?" To which I replied "Yes," rather shyly. He said, "May I apply for it?" "Yes," I replied, "but you must send in a formal application which will be duly considered." The appointment was made and from that date his letters began, "My dear English cousin," and the friendship thus commenced was only ended by his death.

When he stayed with us, he rested, but was always ready to go anywhere or do anything that my father wished. If nothing was wanted he was quite content to sit in the quaint old garden and, as he used to say, "study the life of spiders or of anything else that turned up." Sometimes when he came over to England in the summer my father would be away either on his yacht or visiting his sons, but Dr. Billings never failed to go and see him wherever he might be. It is a little difficult to give an adequate idea of his relations with my father, but it was most like that of a son to a father or a younger brother to one much older and with an element of protectiveness in it.

In the afternoon of the day on which he received his D.C.L. degree here, we all went in a boat on the Cherwell, taking our tea and boiling the kettle on the river bank. I can see him now as he smoothed out carefully a paper bag which had contained buns and sat down upon it. He was, I think, a little tired and was even rather more silent than usual, until we told him that he must tell us some story, when he very solemnly began: "A travelling showman, going around with a Biblical panorama, thus described one of the pictures, 'This, Ladies and Gentlemen, is a picture of Daniel in the Lion's Den and—you will be able to distinguish Daniel *from* the Lions because he carries a green cotton umbrella.'" He then went on with one amusing anecdote after another, and we were never sure whether he had read or heard these stories before or invented them on the spot. He always had a quaint way of putting things. One day he wrote to me from my brother Alfred's house where he was staying with my father, "Sally has taken me under her august patronage." Sally was aged about two years at the time.

My father used often to tell how when they went to some great public dinner in London at which Dr. Billings had to speak, he began in this way:

"Gentlemen, I can now quite understand why the lions did not eat Daniel. It was because they were afraid of having to make an after-dinner speech."

I have been told since his death that Dr. Billings had a stern side to his character, but I can only say that in the many years that I knew him, I never saw it, nor had any idea of it. He impressed one with the strength of his character. "Billings is as magnificent as ever," my father wrote of him to me during his visit to Washington in 1888, but it was strength combined with great tenderness and gentle sympathy though not perhaps very readily expressed except to a few. With us he lived and fitted in like a member of the family and in the last letter which I received from him he finished up with "Give my affectionate regards to all your people—who are also my people—and be sure that I am your affectionate American cousin."

His was a noble soul with no pettiness in it—and the world —our world was much the poorer when the great tender-hearted man passed away.

Billings was an omnivorous reader, particularly of novels, of which, during his later life, he averaged sometimes two an evening, reading himself to sleep with them. The modern novel he declared to be "the most soporific known." Even during massage, which he latterly resorted to as a substitute for the long walks he took in earlier years, he commonly set off the boredom of the procedure by reading something, and for everything he read, science, history, poetry, biography, anecdote, he had a singularly tenacious memory. He seems to have needed none of the mnemonic props which, according to Lord Bacon, make an "exact man." Weir Mitchell likened his memory to "a good index of a vast mental library." Such jottings as he made in commonplace books were usually whimsical jokes or verses, taken down from fugitive literature or from hearsay, rather than from belles-lettres in the ordinary sense. In his early youth, he was fond of reading Hobbes; his writings indicate that he knew Shakespeare, the Bible, Plato, Goethe, Spinoza, and some things from the Greek poets very well, less of Molière and the modern French. In the modern literature of continental Europe, he betrays little interest. He was a systematic reader, not of secular literature, but of science, in particular of surgery, hygiene, statistical science, hospital construction, and the general literature of medicine. Apart from these fields, his most arduous reading appears to have been in the mystic lore of the far East. His interest in painting and music was casual and perhaps conventional. His New York diaries record his attendance as a guest at most of the operas given at the Metropolitan—*Carmen*, *Lohengrin*, *Rheingold* and the rest,—but betray no interest or

enthusiasm. He sometimes whistled a few tunes from the Gilbert and Sullivan operas in a purely mechanical way; and he was fond of hearing his daughters play and sing. During the early days in Washington, he enjoyed an occasional rubber of whist, or a game of billiards, but, in the main, his was a self-sacrificing life, devoted to a daily output of "horseloads of work." Weir Mitchell says:

> When I once spoke of the need for leisurely play and the exercise of open-air sports, he said that he obtained recreation by turning from one form of brain use to another. That was play enough.[1]

Shortly before his death, Dr. Billings said to Weir Mitchell that the various honours which had come to him in his life seemed unimportant as compared with the friendships he had been so happy as to gather on the way. One of the leading motives in his life, as Mitchell said, was "a desire to be loved and respected by those in our profession whom men most rightly honour." In connection with his work, Billings became acquainted with nearly all the prominent medical men of his time. As Professor Welch said at the Johns Hopkins memorial meeting, he knew everybody. His vast correspondence, of Hallerian dimensions, includes interesting batches of letters exchanged with Koch, Lister, Francis Galton, Esmarch, Michael Foster, Clifford Allbutt, Lauder Brunton, and Longmore, to mention only a few. Among his close personal friends, he counted in Germany, Esmarch and von Winckel; in England, Acland, the elder Ord, Brunton, and Burdett; in America, Weir Mitchell, Woodhull, William Pepper, Wood, Jacobi, Osler, and Welch. In England, he was on terms of very cordial friendship with Dr. William M. Ord, whose son married his daughter,

[1] S. Weir Mitchell, *Science*, N. Y., 1913, n. s., xxxviii., 832.

and for Sir Henry Acland, late Regius Professor of Medicine at Oxford, his affection became, in his own words, "almost filial." One of the most eminent scholars of that refined university atmosphere, Acland, like Billings, had laboured with all his powers for the advancement of higher medical education in his own country, and sent a very important and helpful contribution on the subject to the Johns Hopkins Hospital trustees in 1879. As Billings wrote of him:

> He was an artist as well as a scientific man, and the faculty, which enabled him to express, in some of his charming little water colour sketches the feeling aroused by a landscape, also enabled him to appreciate and sympathize with the views of men of widely different objects and tastes, even while he did not agree with some of their conclusions.

Billings wrote to him in 1889:

> I know that your chief object in life is to make other people happy, and I think it no harm to tell you how well you have succeeded with me and mine.

And to his daughter, after his death:

> November 1, 1900. I could not bring myself to write to you just then. I could not find any words except dull, formal phrases, which I could not abide. Of course it is well with him, and well for him to be free from the troublesome body, but I really loved him, and there have been very few of whose affection I felt so sure.

In the last years of his life, Dr. Billings was perhaps most intimate with Dr. Weir Mitchell and Mr. John L. Cadwalader, two old friends whose quiet tastes agreed best with his own views as to the *solve senescentem*. After his death, Weir Mitchell said to Colonel McCaw, at a reception at the Carnegie Institution: "I

have known two great men in my life; one was Wendell Phillips; the other John Billings." Professor Welch said in Baltimore: "He was the wisest man I ever knew." Sir William Osler wrote:

Those of us who were his associates in organisation of the Johns Hopkins Hospital can never forget how unsparing he was of his valuable help, and to me his friendship was one of the most precious gifts of those early days.[1]

Sir Henry Burdett wrote:

He was certainly one of the kindest, most competent, loveable, unselfish, and bravest men of his day and generation.[2]

Dr. Jacobi wrote:

He was not really "one of us," no practitioner, no consultant, not often seen in medical societies. I believe there are many of the younger men who never saw him. But all knew him; knew he was above us. His superior position was recognized by everyone. Everybody knew he had rendered and was constantly rendering, services, unique and such as nobody else could render or imitate.[3]

The esteem and reverence in which Billings was held during his last years may be gathered from some of the personal letters he received after the opening of the New York Public Library.

Sir William Osler wrote:

How splendidly the Library seems to be arranged! I wish Carnegie would give the Bodleian a million dollars, and get you to come over and put us in order.

[1] *Lancet*, London, 1913, i., 860. [2] *Hospital*, London, 1913, liii., 671.
[3] In a private letter to the writer.

Dr. Jacobi wrote:

Pagel says you had a birthday two days ago. I am late but want to congratulate—all of us. He says you are 68 years old, which I refuse to believe. Naturally I think of you very often, but never with more gratitude than when I pass the most beautiful building in New York.

Dr. Weir Mitchell wrote:

My dear John: When next you arrange a public celebration in New York, you had better get a Philadelphian to manage it. Of all the cold-blooded performances I ever saw, that was the worst. The two men who created, made, and carried the thing through, were you and John Cadwalader, and I did not hear the name of either of you mentioned in the whole performance. There was no poetry in it, nor sentiment, not a touch of imagination about this great palace of books. I longed to get up on my hind legs and talk to New York. The only speech worth anything was that of the President, who did have something to say and said it well. The outward appearance of everything was beautiful, only man was vile (as the hymn says), and really to destroy for ever a magnificent opportunity like this went to my heart. I think John Cadwalader felt, and indeed expressed himself most distinctly about, the omission of mention of you.

General Woodhull wrote:

I went to sleep last night with profound altruistic pleasure over the culmination of your bibliographical work in New York. You will have had many congratulations upon your accomplished service. This goes deeper. I am not admiring merely the gold upon the altar, but the altar itself, with an especial feeling for the high priest before it, ministering. . . . *Finis coronat opus* indeed, but I hope you will not be tempted to withdraw to an ease which may possess dignity, but in which there will be vexation of spirit, simply because you are not constituted for rest. I have wandered from my key, which was

the thought of the little house in Georgetown, of Mrs. B. and dear C. (with her bright child's name), of our living on strawberries and bread and milk when the lady of the house absented herself for the time, of your successful struggles with Virchow and the German dictionary, while I pursued my pleasure otherwise. Out of it all has grown an unremitting friendship and this culminating delight.

The man to whom these tributes were written was sometimes rugged and downright in his handling of affairs, a Viking, no doubt, but it is through the friends he attracted to himself that we must see his whole personality. There was absolutely nothing small or mean about him, and, in all his private relations, there was a vast amount of gentle sympathy which was usually implied rather than expressed. No one could look into the eyes of this remarkable man for long together without realizing that he was in the presence of a personality of the first order, "honest as the tides," strong and tireless and reliable as Nature, clean and pure and simple as the great forces in Nature—

> Who, though so noble, share in the world's toil,
> And though so task'd, keep free from dust and soil.

As Henry James said of Lowell:

He was strong without narrowness; he was wise without bitterness and bright without folly. That appears for the most part the clearest ideal of those who handle the English form, and he was altogether in the straight tradition. This tradition will surely not forfeit its great part in the world so long as we continue occasionally to know it by what is so solid in performance and so stainless in character.

APPENDICES

I

GENEALOGY OF THE BILLINGS FAMILY

(*Prepared by the late Mrs. John S. Billings*)

The family of Billings derives its name from its ancient inheritance, Billing, a village in the County of Northampton, where, and in the neighbouring places, they resided many hundred years.

The earliest notice we have of the family is found in the ancient records of the time of Henry the Third, when in the sixth year of his reign (A.D. 1221) a fine was levied between Sarah the daughter of Warine Falconer, demandant, and Henry de Billing, and Wimar his wife, deforciants of a moiety of three virgates of land in Rushden, Northamptonshire, to the use of the said Henry de Billing.

By the requisition taken in the same reign, Henry de Billing was certified to hold a sixth part of one knight fee, in Rushden, of William, Earl of Ferrars, of the honour of Peverel.

From this time for about two centuries we have no trace of the family until we find John Billing, of Rowell, who was patron of the church of Colly-Weston and also had lands in Rushden. He was the father of two sons, Thomas and John, the latter of whom died on the nineteenth of March, 1478, and was buried at Woodford Church, where, on a marble slab at the upper end of the south aisle, was, in brass the figure of a man completely armed, and on a brass tablet at his feet this inscription: "Hic jacet Johannes Billyng Armiger qui obiit xix die mensis Martii, Anno Domini Millimo CCCCLXXVIII cujus anime propicietur Deus. Amen."

He left an only daughter, Dowsabel, who was married to William Brooke, of Astwell of Northamptonshire to whom she carried the estates derived from her father.

Sir Thomas Billing, the eldest son of John Billing of Rowell, was of the Inns of Court and was called to the bar. He was made serjeant-at-law in 1453, and knighted, in 1458, for taking prominent part with the Lancastrian party. When the right to the crown was argued (1466), he appeared at the bar of the House of Lords as counsel for Henry the Sixth, leading the Attorney and Solicitor-General. He was the principal law advisor to Edward the Fourth, and in 1465 was made Justice of the King's Bench, and, in 1468, Lord Chief Justice of the King's Bench. In the spring of the year 1481, he was struck with apoplexy, and expired in a few days, after a tenure of office for seventeen years, in the midst of civil wars and revolutions. He was buried in Battlesden Abbey, in Oxfordshire, where a large blue marble slab was placed over his body having on it the figures in brass of himself and his lady. He is represented in his official robes, and she in a plain dress with short waist and cuffs. On a brass plate beneath is this inscription:

"Orate pro A's' abs̄ Thome Bylling militis quōdm capital. Justic. do^{ni} Regis ad plīta coram ipso Rege ten. et Katerine u^{ris} ej' quodm̄. Thomas obiit V^{o} die me^{s} Maii Ann. M^{o} CCCCLXXX pri^{o} et dicta Katerina obiit VIII^{o} die Martii A^{o} D^{ni} M^{o}CCCCLXXIX^{o} quor̄ a's' ab' ppciet' Deus. Amen." Under the inscription are the figures of five sons and four daughters, and on several labels, "Jhū mercy, and Lady Helpe"; and at the four corners, the Arms of Billing impaling those of Gifford. This and the slab that covered his son Thomas were taken from the Abbey after the dissolution of monasteries and placed at the upper end of the centre aisle of Wappenham Church, where they now remain.

The second wife of Sir Thomas Billing was Mary, daughter and heir of Robert Wesenham of Covington in Huntingdonshire, esquire, and widow of Thomas Lacy and William Cotton. She died on the fourteenth of March 1499, and was buried in the south aisle of St. Margaret's Church at West-

minster, a great portion of which church was rebuilt by herself and her husband Sir Thomas Billing. A sumptuous monument was there erected to her memory. It was an altar-tomb with her figure inlaid in brass, in a mantle, gown, veil, and wimple; out of her mouth a tablet label, "Blessed Lady, etc." and on two scrolls on each side of her, "Blessed Trinity on me have mercy." Over her head the lily-pot between the Virgin and Gabriel with their usual labels: "Ave Maria Gracia plena" and "Ecce Ancilla dom. fiat michi secundū verbū tuū," and above the Deity. At the four corners of the slab were the arms of her family with their several quarterings. Round the ledge of the monument, "Here lieth Dame Mary Bylling, late wife of Sir Thomas Bylling, Knight Chief Justice of England, and to William Cotton and Thomas Lacy: which Mary died the 14 day of March, in the year of our Lord God 1499." In quatrefoils at the ends of the tomb were her family arms (Wesenham), and at the sides the arms of Lacy, Cotton and Billing, all impaling those of Wesenham. This monument has been long since gone, supposed to have been destroyed in 1758, when the church underwent a thorough repair.

Sir Thomas by his first wife Catherine, daughter of Roger Gifford of Twyford, in Buckinghamshire, Esquire, became possessed of Gifford Manor, in the hamlet of Astwell, and parish of Wappenham, in Northamptonshire, afterwards called Billings Manor, where he took up his residence. The ancient manor house, although much curtailed in size, is still standing, and now occupied as a farm house. The children of *Sir Thomas Billing*, all by his first wife were: Thomas his heir (see *infra*); John, who settled in Buckinghamshire (see page 400); Roger of whom nothing is known; William who probably settled in Wedon Back; *Nicholas* (of whom see page 401); Katherine, Isabel, and Margaret.

Thomas Billing, son and heir of Sir Thomas Billing (see *supra*) succeeded to the estates in Astwell. He died on the 23rd of March, 1498–9, and was buried near his father and mother, in Battlesden Abbey, from whence after the dissolution of monasteries, the slab covering his remains was removed together with

that over his father and mother and placed in Wappenham church. On the slab, which is of blue marble, is a brass figure representing him in Armour with a Vizor up and a label issuing from his mouth: "Jhū mcy, Jhū mcy." At each corner is a shield with the arms of Billing impaling those of Brocas, and at the bottom a brass with this inscription: "Hic jacet Tho. Billinge Arm. Filius et heres Thome Billing Capitalis Justiciarii de Banco domini Regis qui obiit xxiii die Martii A° Dom. M—— cujus anime propicietur Deus. Amen." His wife was Margaret, daughter of Bernard Brocas, of Beaurepaire, in Hampshire, Esquire, by whom he had four daughters, co-heiresses.

1. Joan, whose first husband was Stephen Haugh, a Justice of the Common Pleas, by whom she had a son Stephen. She married secondly Thomas Lovett of Astwell, Esquire, being his third wife, and died in 1517, without issue by her second husband, who died February 7, 1491–2, and was buried in Battlesden Abbey under a blue marble slab, having on it the portraiture in brass of a man in armour and this inscription. [Hiatus.]

Billings Manor was enjoyed by this Thomas Lovett in right of his wife. It remained in the family of Lovett until the time of Queen Elizabeth, in the twenty-first year of whose reign (1578), by the decease of Thomas Lovett, Esquire without issue male, it fell to George Shirley Esquire the son and heir of John Shirley, Esquire by Jane his wife the sole daughter and heiress of the said Thomas Lovett, from whom lineally descends Washington, Earl Ferrars.

2. Sibilla, wife of Ingleton.

3. Rose, married to Richard Tresham of Newton in Northamptonshire.

4. Katherine, wife of —— Lynde.

By the marriage of these daughters the large estates of the Billings passed into other families.

John Billing, the second son of Sir Thomas (see page 399) was a merchant of the staple, and resided at Aylesbury in Buckinghamshire, where he died in 1510; having made his will "on the evening of Seynt Bartilmen thappostle" in the same year.

He bequeaths his soul to God, our blessed Lady St. Mary the Virgin, and to all the Saints of Heaven, and desires to be buried in the church Aylesbury, to which church, and the church of Dodington, in Oxfordshire, he makes bequests. To his wife Agnes, he gives all his household furniture, half his plate, and one hundred pounds in money. He also makes bequests to the two daughters of his son William, which son he appoints executor and makes residuary legatee.

This William was also merchant of the Staple, and resided at Dodington, in Oxfordshire, where he died in 1534. By his will, dated in the same year, he desires to be buried in the church of Dodington, in the Trinity Guild, near his wife Elizabeth. He makes bequests to his daughters, Mary wife of Ralph London, and Jane, wife of Anthony Skinner, to Eleanor, wife of his son John, and directs that the said John shall be sent to the University of Oxford, giving a large sum to the New College there in his behalf. He appoints his wife Tybalde and son John co-executors of the will and his brother Charles and Doctor London overseers.

John Billing, the son and heir, had an only daughter who was married to Richard Wheatell, of Shepley of Lincolnshire, to whom she conveys the estates.

Nicholas Billing, the fifth and youngest son of Sir Thomas Billing (see page 399) was of Middleton Malzor, in Northamptonshire. He died in 1512, having made his will on the twenty-third day of October in the same year. After bequeathing his soul to God, Our Lady Saint Mary, and all the Holy Company of Heaven, he directs that his body shall be buried in the church of Middleton Malzor by the side of his wife Agnes. After making bequests to various religious objects in the church, he provides for masses of requiem to be performed at Battlesden Abbey for five years, on each anniversary of his death. His wife was Agnes, daughter of Stephen Gilbert of Middleton Malzor, by whom he had besides two daughters, Katherine and Agnes, four sons.

1. Roger. 2. William of Middleton Malzor, died in the year 1526 without issue, leaving the principal part of his estate to his nephew William, son of his brother John.

3. Henry probably of Wappenham. 4. *John* of Middleton Malzor.

John Billing of Middleton Malzor, fourth and youngest son of Nicholas (see page 401) died in 1526. In his will, after making the usual bequests for religious purposes, repairing the roads, etc., he provides for his children, appoints his son William executor and makes him residuary legatee. His children were *William* (see *infra*); Nicholas of Middleton Malzor; Thomas who removed to Weekly in Northamptonshire; Agnes, wife of Bodyenge.

William Billing of Middleton Malzor, the eldest son of John Billing, of Middleton Malzor, was also of that place, where he died in 1557. His will was dated on the thirteenth day of September, 1557, and proved on the fourth of November in the same year. He bequeaths his soul to God, Our Lady St. Mary, and to all the Saints in Heaven, and desires to be buried in the church of Middleton Malzor near his father and mother. By his wife Joan, who survived him, he had besides his daughter Katherine, three sons: William who died before his father leaving a widow Elizabeth; *Roger* of Somersetshire (see *infra*); Richard, also of Somersetshire, where he married in Taunton, January 20, 1561–2 Katherine Wilcox, by whom he had three sons, Richard, Nicholas, and John. He resided at East Lydford.

Roger Billing, second son of William Billing (see *supra*) having, with his brother Richard, inherited lands in Somersetshire from his father, removed to that county and settled at Baltonsborough, near Glastonbury, where he was buried December 16, 1596. From a parchment document containing the names of the principal landholders in the parish, preserved in the great chest in the church, it appears that he was possessed of considerable real estate there, which by his will dated December 14, 1596, and proved on the twentieth of April of the following year, he bequeathed to his two sons Richard the elder and Richard the younger, to be equally divided by his brother, Richard Billing of East Lydford, and other persons whom he names. By his first wife Katherine, who was buried at Baltonsborough, February 12, 1566/7, he had:

Richard, called in his father's will Richard the elder (see *infra*); Elizabeth baptized January 8, 1561/2 buried October 1, 1587; John, baptized January 8, 1564, buried May 31, 1573. His second wife was Edith Colburn, whom he married at Baltonsborough, December 5, 1573. She was buried there July 4, 1605. Their children were Agnes, baptized November 7, 1574; Christopher baptized December 25, 1575, buried March 11, 1589/90; Agatha, baptized October 18, 1578; Mary, baptized December 18, 1581; Richard, called Richard the younger, baptized November 8, 1584. Richard the younger resided sometime at Baltonsborough, where he married May 22, 1617, Susan Rushe, by whom he had a daughter Edith who was baptized April 14, 1619. It appears from the register that he was church warden in 1628, but what became of him afterwards is not ascertained.

Richard Billing, the eldest son of Roger Billing of Baltonsborough (see page 402), and called Richard the elder, removed to Taunton, where he married Elizabeth daughter of Ebenezer Strong of that place, and was possessed of landed property, which by his will, dated in 1604, he gave to his children. He also made bequests to the reparation of the Church of St. James, in Taunton, to the poor of that parish and of Baltonsborough, and left twenty shillings to his brother Richard to make him a ring in remembrance of him. He appointed his wife executrix of the will and made her residuary legatee of all his personal estate. Their children were besides Elizabeth who was married to Thomas Savage, Richard, Roger, Ebenezer, *William* (see *infra*).

William Billing, the youngest son of Richard Billing the elder (see *supra*), had by his father's will, a house and land in Taunton, called *Deanes*, which passed to his son, *William*, who, emigrating to New England, sold it to his brother, Ebenezer of Glastonbury in Somersetshire. By his will dated in 1659, he having a wife but no children bequeathed this property to his nephew, Ebenezer Billings, son of his brother Joseph Billing, deceased, describing it as formerly belonging to his brother William Billing, then in New England.

William Billing, son of William Billing (see *supra*), of

Taunton, disposed of his lands there, and came to New England about the middle of the seventeenth century. He is said to have been one of the original proprietors of Lancaster in Massachusetts, in 1654, but in 1658, the fifth of February, we find him at Dorchester on which day he married Mary ——. The record of the marriage not giving her surname, stands thus: "William Billing was married unto Mary —— by Mayor Atharton 5; 2; 57." In the same year, he joined the company of William Cheeseborough at Stonington, Connecticut, where he became one of the largest landed proprietors in that and neighbouring towns. He died on the sixteenth of March, 1713, and his widow in 1718. His will, dated October 13, 1712, was proved on the fourteenth of April following. It is a curious specimen of orthography, in which the name is spelt Billinges, not written by the testator, but signed by him without the final s. He bequeaths to his wife all his household furniture forever, and one third part of his real estate during her life. To his son William he gives his real estate in Preston and other places. To all his children and grandchildren he makes bequests and appoints his son Ebenezer executor and makes him residuary legatee. His children the first five of whom were baptized at Stonington on the same day, viz.: September 1, 1672, were: (1) William of Preston; (2) *Ebenezer* of Stonington (see *infra*); (3) Joseph who died young; (4) Mary died young; (5) Lydia; (6) Mercy born October 27, 1674; (7) Mary baptized March 14, 1675/6; (8) Abigail, baptized July 1, 1677; (9) Dorothy, baptized September 28, 1679; (10) Patience baptized April 9, 1682; (11) Prudence, March 4, 1683.

Ebenezer Billing, the second son of William Billing of Stonington (see page 403) was also of that place. His father appointed him executor of his will. His own, dated February 20, 1726/7, was proved at New London, October 5, 1727. He married at Stonington, March 1, 1680, Anne daughter of —— Comstock. "Mr. Billings served in the Colonial wars" (see *Billings Family History of Stonington, Conn.*, 1900). Their children were: (1) Anne, born October 7, 1681, married to —— Hakes; (2) Ebenezer, born January 1, 1684; (3) William,

born April 4, 1686; (4) *James*, born October 4, 1688 (see *infra*); (5) Zipporah, born May 11, 1691, married to Thomas Strickland of New London; (6) Margaret, born April 11, 1693, married February 8, 1717 to Jeremiah Burch; (7) Jemima, baptized April 15, 1695, married to Baldwin; (8) Increase, born May 13, 1697; (9) Thankful, born February 7, 1698/9, married to —— Smith. (She had a daughter Mary Powell, mentioned in the will of her grandfather Ebenezer Billings, 1727); (10) Benjamin, born September 28, 1703.

James Billings, the fourth child of Ebenezer Billing of Stonington (see page 404) was himself of that place; born October 4, 1688, died there in 1761 aged 73 years; having made his will on the 23 of July in that year. He married, March 17, 1714/15, Mary daughter of Benjamin Hewitt; her will is dated January 29, 1763. Children: (1) Zipporah, born October 2, 1715; (2) James, born September 20, 1719; (3) Eunice, born August 17, 1720, married Timothy Babcock; (4) Lois, born January 6, 1723/34; (5) Amos, born May 9, 1728, married January 10, 1749/50, Bertha — Minor and had a daughter Mary, born August 27, 17—; (6) David, born September 6, 1730; (7) *Jesse*, born April 18, 1737.

Jesse Billings I. The fourth son of James Billings of Stonington (see *supra*) was himself of that place, born April 18, 1737. Said to have served in the Revolutionary War with the rank of captain. He married Grace Breed, cousin of Ebenezer Breed, of Breed's Hill (Bunker Hill) daughter of John Breed and Mary Prentice; she was born June 2, 1740. They removed after the Revolutionary War to Old Saratoga, Saratoga County, New York, where they died. Their children were Elihu m. Tiddie Wright; Henry m. Lucy Wright; John; Grace m. Daniel Morgan; Esther m. Roswell Holmes; *Jesse II* m. Phœbe Smith.

Jesse Billings II. He was of Saratoga, New York. Married Phœbe Smith, daughter of Thomas Smith. Their children were Jesse III. m. Mary Thompson; John; William J. m. Maria Groesbeck; Sally m. Elijah Dunham; Betsy m. Edward Perry; Almira m. Elias Cole; Phœbe m. William Thorn; Emma m. Otis Bates; Mary m. Stephen Thorne; *James Billings* m. Abby Shaw.

James Billings, son of Jesse Billings II. (see page 405) was born at Saratoga, New York, March 15, 1806; married July 21, 1835, Abby Shaw of Raynham, Mass. She was a lineal descendant of John Howland, the Pilgrim. Mr. and Mrs. Billings removed to Indiana and later to Dayton, Ohio. He died there March 8, 1892. Mrs. Billings died in 1898. Both are buried in the cemetery at that place, called Woodland. "Billings.—James Billings died March 8, 1892, aged 86 years. Will be buried from his late residence, 117 Euclid Avenue, March 9th, at 10 A.M. Interment Woodland." Their children were Martha and Emma, born July 14, 1836, died July 18, 1836; John Shaw Billings, born April 12, 1838; Emma Billings, born March 28, 1840, m. Jordan; Abby S. Billings, born March 1, 1843, died December 29, 1843.

John Shaw Billings, born in Indiana, April 12, 1838, commissioned U. S. A. 1862. Served until 1895, when he asked to be retired, to take up university and medical work at Philadelphia in connection with the University of Pennsylvania in 1896. Was called to New York City as Director of The New York Public Library, Astor, Lenox, and Tilden Foundations. He was a surgeon in the U. S. Army, retiring with the rank of Lieutenant-Colonel. He married September 3, 1862 at Georgetown, D. C., Katharine Mary Stevens. Their children were Mary Clare, born November 9, 1863; Kate Sherman, Jessie Ingram, twins, born October 23, 1866; John Sedgwick, born July 31, 1869, Margaret Janeway, born November 4, 1872.

John Sedgwick Billings, the son of John Shaw Billings (see *supra*) was born in Georgetown, D. C., July 31, 1869. Marriages, Mary Clare m. Dr. Wm. Wallis Ord, Georgetown, D. C., October 5, 1892; Kate Sherman m. Wm. Wilson, November 26, 1891, Georgetown, D. C.; Jessie Ingram m. Bradfield Hartley, September 3, 1890, Georgetown, D. C.; *John Sedgwick* m. April 20, 1897, Katharine Hammond, daughter of Major Harry and Emily Cumming Hammond of Redcliffe Beech Island, S. C. Children of John Sedgwick Billings: *John Shaw Billings 2nd*, born at Redcliffe, South Carolina, May 11, 1898. *James Henry Hammond Billings*, born at Lawrence Park, Manhattan, July 13, 1901. *Julian Cumming Billings*, born in New York City, February 21, 1904.

(Tombstone Inscription)

In Memory of Captain Jesse Billings 1st, who died February 12, 1820, in the 83rd year of his age. "God my Redeemer lives and often from the skies looks down and watches all my dust till he shall bid it rise." Grace, wife of Captain Jesse Billings who died October 21, 1818, in the 77th year of her age. "She was useful in life, calm in death, at Jesus' will resigned her breath." (See page 405.)

Jesse Billings II. (see page 405). Died October 6, 1844, aged 74. Write "Blessed are the dead who die in the Lord." "Phœbe Billings, wife of Jesse Billings died October 1, 1843, in her 72d year."

Demise of Mr. James Billings

(*Newspaper Notice.*)

The venerable James Billings died this morning, after several months' illness, on his birthday, aged eighty-six years.

Father Billings was born in Saratoga, N. Y., March 15, 1806. He came West in 1830, and in 1835 he was married to Miss Abby Shaw, in Cincinnati, where he resided several years. He afterwards removed to Oxford, Butler County, where he was in business for a long time. Mr. Billings came here during the war of the rebellion, and was for several years a government storekeeper at the various distilleries in the Third Ohio United States Revenue District. He also occupied other positions of honour and trust, and in each position he proved to be a faithful and efficient officer. Mr. Billings was a notably intelligent citizen, a great reader, and was so well posted on current events as to be able to render a valuable opinion on any topic under discussion.

He was for most of his life an accepted and faithful member of the Presbyterian Church, and was at the time of his decease a member of the Fourth Presbyterian Church here. His wife and two children survive him—Dr. John S. Billings, a distinguished Army Surgeon, of Washington, D. C., and Mrs. Emma T. Jordan, of this city [Dayton, Ohio].

II

2125464 MILITARY RECORD

War Department, the Adjutant-General's Office,
Washington, Feb. 13, 1914.

From: The Adjutant-General of the Army.
Subject: Record of service of John S. Billings, late Colonel United States Army.

1. The records show as follows: John Shaw Billings, born April 12, 1838, was appointed First Lieutenant and Assistant Surgeon, April 16, 1862; accepted the appointment, July 16, 1862; was appointed Captain and Assistant Surgeon, July 28, 1866; Major and Surgeon, December 2, 1876; Lieutenant-Colonel and Deputy Surgeon-General, June 6, 1894; retired October 1, 1895, at his own request, and died March 11, 1913, in New York City; brevetted Captain, Major, and Lieutenant-Colonel, United States Army, March 13, 1865, for faithful and meritorious service during the war.

2. Service: In charge of the Cliffburne General Hospital, D.C., April to August, 1862; ordered to Philadelphia, Pennsylvania, for duty in West Philadelphia Hospital per S. O. 194, A. G. O., August 18, 1862, and was on duty as executive officer in the Satterlee General Hospital, Philadelphia, Pennsylvania, to March 20, 1863. He was ordered to report to Medical Director, Army of the Potomac, for assignment to duty, and served with the 11th United States Infantry in 2d Division, 5th Corps, and was also in charge of the operations of the Division Field Hospital. On May 15, 1863 (no order found),

he was assigned to duty with the 7th and 10th Infantry, and served with them until after the battle of Gettysburg, Pennsylvania, when he was left behind with the wounded in charge of the Division Hospital, and was shortly afterward taken sick and sent to Washington. He rejoined his command in August, 1863, and went with it to New York City, and served there to October 13, 1863, when sent to General Hospital, Fort Schuyler, New York, for duty. On November 1, 1863, he was placed in charge of De Camp General Hospital, New York, and on November 20, 1863, he was placed in charge of General Hospital at Fort Wood, New York. On February 1, 1864, he was sent to the West Indies with a special expedition under the direction of the Secretary of the Interior. By S. O. 131, A. G. O., March 29, 1864, he was ordered to duty in the Army of the Potomac, and was on duty at headquarters Army of the Potomac, as Acting Medical Inspector of the Army to July 26, 1864, when taken sick, and granted twenty days' sick leave in S. O. 199, Army of the Potomac, July 26, 1864. He was granted permission to remain in Washington, D. C., for medical treatment per S. O. 268, A. G. O., August 12, 1864. By S. O. 277, A. G. O., August 22, 1864, he was relieved from duty in the field, and ordered to report to the Medical Director, Army of the Potomac, for duty in his office in this city, and was on that duty to December 27, 1864, when he reported for duty in the Surgeon-General's Office, per S. O. 476, A. G. O., December 31, 1864, and was on duty there to August 20, 1895. In addition to his duties he was ordered to report to the Secretary of the Treasury for special duty in connection with the examination of the Marine Hospital Service, per S. O. 219, A. G. O., September 11, 1869, and was on this duty, September 13, 1869 to September, 1870. He was also detailed as member of the National Board of Health by direction of the President, March 28, 1879, and served as such to August 17, 1882. He sailed for London, England, June 22, 1881, as a delegate to the International Medical Congress, and rejoined at Washington, D. C., November 9, 1881, per S. O. 110, A. G. O., May 13, 1881. He was ordered to Hot Springs, Arkansas, in connection with the erection of Army and Navy Hospital there by letter of

A. G. O., August 16, 1882. He was a delegate to attend the health exhibition and meeting of the International Medical Congress at Copenhagen and Berlin, and sailed from New York for this duty July 1, 1884, and returned to United States in September, 1884, this by S. O. 44, A. G. O., February 21, 1884. He was on duty April 24 to May 3, 1885, to represent the Medical Department of the United States Army at the annual meeting of the American Medical Association at New Orleans, Louisiana, per S. O. 91, A. G. O., April 21, 1885; absent on duty in Berlin, Germany, as delegate to the International Medical Congress, June 3, to August 31, 1890, per S. O. 115, A. G. O., May 17, 1890; detailed as professor of military hygiene at the Army Medical School, Washington, D. C., per G. O. 78, A. G. O., September 22, 1893. He was absent July 20 to October 1, 1894, representing the Medical Department at the meeting of the International Congress at Budapest, per letter A. G. O., July 16, 1894.

3. Special orders of the Adjutant-General's Office directing him to perform certain temporary duties, etc., may be consulted in the Surgeon-General's Library. The numbers of the orders are as follows: S. O. 25, January 18, 1871; S. O. 113, March 24, 1871; S. O. 99, May 15, 1873; S. O. 118, May 28, 1874; S. O. 145, July 3, 1874; S. O. 260, November 20, 1874; S. O. 31, February 23, 1875; S. O. 106, May 31, 1875; S. O. 72, April 10, 1876; S. O. 103, May 26, 1876; S. O. 182, September 2, 1876; S. O. 106, May 18, 1877; S. O. 109, May 21, 1878; S. O. 221, October 14, 1878; S. O. 242, November 8, 1878; S. O. 97, April 23, 1879; S. O. 255, November 11, 1879; S. O. 89, April 22, 1880; S. O. 107, May 14, 1880; S. O. 251, November 26, 1880; S. O. 96, April 27, 1881; S. O. 190, August 17, 1882; S. O. 105, May 7, 1883; S. O. 157, July 9, 1887; S. O. 110, May 13, 1889; S. O. 168, July 23, 1889; S. O. 230, October 3, 1889; S. O. 35, February 12, 1891; S. O. 144, June 20, 1892; S. O. 54, March 11, 1893; S. O. 117, May 24, 1893; S. O. 177, August 4, 1893, and S. O. 198, August 24, 1895.

F. J. Koester,
Adjutant General.

III

BIBLIOGRAPHY OF THE WRITINGS OF JOHN SHAW BILLINGS, 1861–1913

(Prepared by Miss Adelaide R. Hasse, Chief of Division of Public Documents, New York Public Library.)

1. "The Surgical Treatment of Epilepsy." *Cincinnati Lancet and Observer*, 1861, iv., 334–341.
2. "Cliffburne Hospital, Washington, D. C." (Extract from a report of Asst. Surgeon J. S. Billings. [1863.]) *Medical and Surgical History of the War of the Rebellion*, part 3, p. 910.
3. "Letter to Col. Thomas A. McParlin, Medical Director Army of the Potomac, Transmitting the Statistics of Sick and Wounded of the Army of the Potomac for 1864." Dated Washington City, June 17, 1865. *Rebellion Records*, ser. 1, v. 42, pt. 1, pp. 202–203.
4. "Report [to Col. McParlin] on the Treatment of Diseases and Injuries in the Army of the Potomac during [June] 1864." [1865.] *Medical and Surgical History of the War of the Rebellion*, part 1, app., pp. 199–202.
5. "Report of the Results of the Examinations of Fluids of Diseased Cattle with Reference to Presence of Cryptogamic Growths." By Dr. J. S. Billings and Dr. Edward Curtiss. In: *United States. Commissioner of Agriculture. Report on Diseases of Cattle in the United States*, Washington, 1869, pp. 156–170, 1 pl.
6. "A Report on Barracks and Hospitals; with Descriptions of Military Posts." Washington, 1870, xxxiii, 494 pp., 13 pl. 4°. (United States. War Department. Surgeon-General's Office. Circular No. 4.)
7. "The Study of Minute Fungi." *Am. Naturalist*, Salem, 1871, v., 323–329.
8. "The Genus Hysterium and Some of its Allies." *Am. Naturalist*, Salem, 1871, v., 626–631, 1 pl.
9. "On Some Minute Fungi." (Abstract of a paper read February 5, 1872.) *Bull. Phil. Soc.*, Wash., 1871–4, i., 42–43.
10. "On the Collection of a Large Library." (Abstract of a memoir presented December 6, 1873.) *Bull. Phil. Soc.*, Wash., 1871–4, i., 92.

11. "Abstract of Special Reports by Army Medical Officers on the Effect of Mountain Climates upon Health." (Read at Annual Meeting, Philadelphia, November 12, 1874.) *Am. Pub. Health Assoc. Rep.*, 1874–5, New York, 1876, ii., 148–150.
12. "Notes on Hospital Construction." *Am. Pub. Health Assoc. Rep.*, 1874–5, New York, 1876, ii., 384–388.
13. "A Bibliography of Cholera." In: *The Cholera Epidemic in the United States*, Washington, Gov. Prtg. Off., 1875, pp. 707–1025.
—— Same. U. S. 43 Cong., 2d Sess., House Ex. Doc. 95.
14. "Remarks on Medical Topography." (Read at the Annual Meeting in Baltimore, 1875.) *Am. Pub. Health Assoc. Rep.*, 1874–5, New York, 1876, ii., 47–54.
15. "A Report on the Hygiene of the United States Army; with Descriptions of Military Posts." Washington, Gov. Prtg. Off., 1875. lix, 567 pp. 13 pl., 1 map. 4°. (United States War Department. Surgeon General's Office. Circular No. 8.)
16. "Hospital Construction and Organization." In: *Hospital Plans . . . Johns Hopkins Hospital*, New York, 1875, pp. 3–46, 9 pl. 8°.
17. "Report of the Committee on the Plan for a Systematic Sanitary Survey of the United States." (Submitted at the Annual Meeting in Baltimore, Nov. 10, 1875.) *Am. Pub. Health Assoc. Rep.*, 1874–5, New York, 1876, ii., 41–54. *Also* Reprint with extensive *questionnaire*.
18. "A Century of American Medicine, 1776–1876; Literature and Institutions." In: *A Century of American Medicine*, 1776–1876. 12°. Philadelphia, H. C. Lea, 1876, pp. 289–386. *Also: Am. Jour. Med. Sc.*, Phila., 1876, n. s. lxxii., 439–480.
19. *Johns Hopkins Hospital.* Reports and Papers Relating to Construction and Organization, No. 1–3, 5. [Baltimore, 1876–78.] 8°.
 No. 1. 1876. 19 pp.
 No. 2. 1876. 17 pp. 14 pl.
 No. 3. 1877. 19 pp.
 No. 5. Report on Heating and Ventilation. 1878. 93 pp.
20. "Medical Libraries in the United States." In: *Public Libraries in the United States. . . . Special Report. Department of Interior. Bureau of Education.* 8°. Washington, 1876, pp. 171–182.
21. "The Rights, Duties, and Privileges of the Community in Relation to those of the Individual in Regard to Public Health." (Address at the Annual Meeting in Boston, October 5, 1876.) *Am. Pub. Health Assoc. Rep.*, 1875–6, New York, 1877, iii., 49–52.
22. "Bacteria and Spontaneous Generation." (Abstract of Communication. February 10, 1877). *Bull. Phil. Soc. Wash.* (1874–8), 1880, ii., 109–110.
23. "On the Plans for the Johns Hopkins Hospital at Baltimore." *Med. Rec.*, New York, 1877, xii., 129; 145.
24. [Twenty Lectures on the History of Medicine, Medical Education, and Medical Legislation, delivered at the Johns Hopkins University,

Baltimore in 1877–8.] MS. [not printed with exception of the last of the series, *i.e.*:]

25. *Medical Education.* (Extracts from Lectures Delivered before the Johns Hopkins University, Baltimore, 1877–8.) Baltimore, W. K. Boyle & Son, 1878. 1 p. l., 42 p. 8°.
26. ["Suggestions with Regard to Incorporating in the Approaching United States Census Statistics of Diseases as well as of Deaths." (Transmitted to the Hon. S. S. Cox, M.C., Chairman Committee on Census of 1880, by Surgeon-General, United States Army. Washington, Oct. 15, 1878.)] 2 l. Washington, 1878. 8°. Also in: *Am. Pub. Health Assoc. Rep.*, 1877–8, Boston, 1880, iv., 373–375.
27. "Introduction on Hygiene." Including: I. Prefatory Remarks. II. Causes of Disease. III. Jurisprudence of Hygiene. *In*: A. H. Buck's *Treatise on Hygiene and Public Health*, 8°. New York, 1879, i., 11–70.
28. "Report of the Committee Charged with Making a Sanitary Survey of Memphis, Tenn." *Rep. Nat. Bd. Health*, Wash., 1879, 237–262: 1880, 416–441.
29. "Address in State Medicine and Public Hygiene." *Tr. Am. Med. Assoc.*, Phila., 1879, xxx., 275–291. *Also* Reprint.
30. "The Medical Journals of the United States. *Boston Med. and Surg. Jour.*, 1879, c., 1; 108.
31. The Study of Sanitary Science. *Plumber*, N. Y., 1878–9, ii., 125.
32. "The National Board of Health and National Quarantine." *Tr. Am. Med. Assoc.*, Phila., 1880, xxxi., 435–455. *Also* Reprint.
33. "Report of Committee on the Nomenclature of Diseases and on Vital Statistics; J. S. Billings, Chairman." October 20, 1880. *Rep. Nat. Bd. Health*, 1880, Wash., 1882, ii., 537–594.
34. "Report on Sanitary Survey of Memphis, Tenn." *Rep. Nat. Bd. Health*, 1880, Wash., 1882, ii., 602–617.
35. "Remarks on Sanitary Condition of Memphis." *Proc. San. Convent.* (Detroit), Lansing, 1880, 69–72.
36. "The President's Address at the Eighth Annual Meeting of the American Public Health Association, New Orleans, December 7, 1880." *Am. Pub. Health Assoc. Rep.*, 1880, Bost., 1881, vi., 1–11.
37. "The Report of the Advisory Council on National Sanitary Legislation"; Dr. J. S. Billings, President of the Association, Chairman *ex-officio*. [1880.] *Am. Pub. Health Assoc. Rep.*, 1880, Bost., 1881, vi., 385–401.
38. "The Scientific Work Carried on under the Direction of the National Board of Health." (Abstract of remarks. November 20, 1880.) *Bull. Phil. Soc.*, Wash., 1880–1, iv., 37–39.
39. "The National Board of Health." *Plumber*, New York, 1879–80, iii., 47, 273.
40. "National Health Legislation on Trial." *Am. Jour. Med. Sc.*, Phila., 1879, n. s., lxxviii., 471–479. *Also: Sanitarian*, New York, 1879–80, vii., 501–510.

41. "The Organization and Operation of the National Board of Health." *Med. Record*, New York, 1880, xvii., 101–103.
42. "Who Founded the National Medical Library?" *Med. Record*, New York, 1880, xvii., 298.
43. "Letters to a Young Architect on Ventilation and Heating." *Plumber*, New York, 1879–80, iii., 132, 154, 171, 191, 211, 233, 251, 271, 291, 311, 331, 351, 371, 392, 415, 432, 463; Continued in: *Sanit. Engin.*, N. Y., 1880–81, iv., 8, 37, 68, 83, 110, 131, 155, 180, 203, 228, 253, 274, 305, 329, 470, 496, 536, 554; 1881–2, v., 6, 99, 266; 1882, vi., 369, 492; 1882–3, vii., 6, 122, 219, 339, 434, 602; 1883, viii., 523. [Reprinted as: *The Principles of Ventilation and Heating* (infra). 1884.]
44. "Yellow Fever." *Internat. Rev.*, N. Y., 1880, viii., 29–49. *Also* Reprint.
45. "Our Medical Literature. Address." *Tr. Internat. Med. Cong.*, Lond., 1881, i., 54–70. *Also* Reprint. *Also: Brit. Med. Jour.*, Lond., 1881, ii., 262–268. *Also: Lancet*, Lond., 1881, ii., 265–270. *Also: Boston Med. and Surg. Jour.*, 1881, cv., 217–222. *Also transl.* [French]: *Rev. Scient.*, Paris., 1882, xxix., 586–596. *Also transl.* [Dutch]: *Geneesk. Courant*, Tiel, 1881, xxxv., Nos. 44–48. *Also transl.* [Russian]: *Vrach Vaidom.*, St. Petersb., 1881, vi., 2534, 2559, 2573, 2594. *Also transl.* [Norwegian]: *Norsk Mag. f. Lægevidensk.*, Christiania, 1882, xii., 141–166.
46. "The Experience of the United States in Recent Years with Regard to Asiatic Cholera and Yellow Fever." *Tr. Internat. Med. Cong.*, London, 1881, iv., 416–428.
47. "Mortality Statistics of the Tenth Census." *Tr. Am. Med. Assoc.*, Phila., 1881, xxxii., 297–303. *Also* [Abstr.]: *Bull. Phil. Soc. Wash.*, 1880–81, iv., 164–165.
48. "Patents on Ventilating Apparatus." *Sanit. Engin.*, N. Y., 1880–81, iv., 327.
49. "The Registration of Vital Statistics." *Rep. Nat. Bd. Health*, 1882, Wash., 1883, 355–461. *Also* [Abstr.]: *Am. Jour. Med. Sc.*, Phila., 1883, n. s., lxxxv., 33–50.
50. "The Registration of Vital Statistics in the United States." *Nat. Bd. Health Bull.*, Wash., 1881–2, iii., 295.
51. "On the Ventilation of the House of Representatives." (Abstract of remarks. April 8, 1882.) *Bull. Phil. Soc. Wash.* (1881–82), 1883, v., 99–100.
52. "The Information Necessary to Determine the Merits of the Heating and Ventilation of a School Building." *Circ. Bureau Educat.*, Wash., 1882, No. 2, 11–19.
53. "Notes on Military Medicine in Europe." *Jour. Mil. Serv. Inst. U. S.*, Governor's Island, N. Y. H., 1882, iii., 234–247.
54. "The Vaccination Question." *Nation*, N. Y., 1882, xxxiv., 201–202.
55. "House Sanitation in Large Cities." *Sanit. Engin.*, N. Y., 1881–2, v., 338.

56. "Address [Delivered March 15, 1882] to the Graduating Class of Bellevue Medical College." *Med. News*, Phila., 1882, xl., 285–288.
57. "Medical Bibliography." *Tr. Med. and Chir. Fac. Maryland*, Balt., 1883, 53–80. *Also* Reprint.
58. "The Heating and Ventilation of a School Building." *Sanit. Engin.*, N. Y., 1882–3, vii., 317.
59. "Germs and Epidemics." *Sanit. Engin.*, N. Y., 1882–3, vii., 341, 387.
60. "Papers on Vital Statistics." *Sanit. Engin.*, N. Y., 1883, viii., 418, 442, 488, 541, 588: 1883–4, ix., 15, 163: 1884–5, xi., 9, 80, 128, 249.
61. "The World's Industrial and Cotton Centennial Exposition, New Orleans, La., 1884–5." Medical Department, United States Army, Exhibit Class 4, No. 5–7. New Orleans, 1884. 8°.
 No. 5. Description of selected specimens from the medical and surgical sections of the Army Medical Museum, at Washington, D. C. 20 pp.
 No. 6. Description of the microscopes and microscopical preparations from the Army Medical Museum, Washington, D. C. 15 pp.
 No. 7. Description of the composite photographs of crania, and of crania from the Army Medical Museum, Washington, D. C. 15 pp.
62. "The Principles of Ventilation and Heating and their Practical Application." New York. The Sanitary Engineer, 1884. x, 13–216 pp. 8°.
——— Same. London, Trübner & Co., 1884, 226 pp. 8°.
63. "Composite Photography Applied to Craniology." (Abstract of communication. March 29, 1884.) *Bull. Phil. Soc. Wash.*, 1884, vii., 25–26.
64. ["Report of Resolutions in Memory of Joseph Janvier Woodward with Abstract of Remarks on Dr. Woodward's Work, etc."] November 8, 1884. *Bull. Phil. Soc. Wash.*, 1884, vii., 75–76.
65. "The Mortality Rates of Baltimore; Life Table for Baltimore; Mortality in Different Wards; Causes of Disease." *Maryland Med. Jour.*, Balt., 1883–4, x., 487–489.
66. "Methods of Tabulating and Publishing Records of Deaths." 1885. *Am. Pub. Health Assoc. Rep.*, 1885, Concord N. H., 1886, xi., 51–66.
67. "On Composite Photography as Applied to Craniology." By John Shaw Billings, and "On Measuring the Cubic Capacity of Skulls," by Washington Matthews. (Read April 22, 1885.) *Mem. Nat. Acad. Sc.*, Wash., 1886, iii., pt. 2, 105–116, 20 pl. *Also* [Abstr.]: *Science*, Cambridge, 1885, v., 499.
68. "On a New Craniophore for Use in Making Composite Photographs of Skulls." By John Shaw Billings and Washington Matthews. (Read November 12, 1885.) *Mem. Nat. Acad. Sc.*, Wash., 1886, iii., pt. 2, 117–119, 4 pl.
69. "Memoir of Joseph Janvier Woodward." *Nat. Acad. Sc., Biog. Mem.*, Wash., 1886, ii., 295–307. *Also* Reprint.

70. "Report on the Mortality and Vital Statistics of the United States as Returned at the Tenth Census" (June 1, 1880). Washington, Gov. Prtg. Off., 1885–6. 3 vols. 2 v. text, 1 v. pls. 4°. United States Census Office, Rept. 10th Census., v. 11–12.

—— Same. 47 Cong., 2 sess. House Misc. Docs. v. 13, pt. 11–12.
Text, v. 1. 1885. lxiii, 767 pp.
Text, v. 2. 1886. clviii, 803 pp.
Plates. 17,19 plates, 38 diagrams.

71. "Sewage Disposal in Cities." *Harper's Mag.*, New York, 1885, lxxi., 577–584.

72. "Scientific Men and their Duties." (The President's address before the Philosophical Society of Washington, December 4, 1886.) *Bull. Phil. Soc.*, Wash., 1886–7, ix., pp. xxxv–lvi. *Also* Reprint.

73. "On Museum Specimens Illustrating Biology." (Abstract of communication presented at 288th meeting of the Philosophical Society of Washington, May 22, 1886.) *Bull. Phil. Soc. Wash.*, 1886–7, ix., 35–36.

74. "Medicine in the United States, and its Relations to Co-operative Investigation." The annual address in medicine delivered before the British Medical Association, August 11, 1886. *Brit. Med. Jour.*, Lond., 1886, ii, 299–307. *Also: Med. News*, Phila., 1886, xlix, 169–180. *Also* Reprint.

75. "Hot Water and Steam Heat Compared." *Sanit. Engin.*, N. Y., 1886, xiv., 595.

76. "Effect of Freezing on the Typhoid Germ." *Sanit. Engin.*, N. Y., 1886–7, xv., 211.

77. "Methods of Research in Medical Literature." *Tr. Assoc. Am. Physicians*, Phila., 1887, ii., 57–67. *Also: Boston Med. and Surg. Jour.*, 1887, cxvi., 597–600. *Also* Reprint.

78. "Forms of Tables of Vital Statistics, with Special Reference to the Needs of the Health Department of a City." *Amer. Pub. Health Assoc. Rep.*, Concord, N. H., 1888, xiii., 203–223. *Also* Reprint.

79. "Medical Museums, with Special Reference to the Army Medical Museum at Washington." *Med. News*, Phila., 1888, liii., 309–316. *Also* Reprint.

80. "The History of Medicine." Introductory Lecture [to a course delivered at Lowell Institute]. *Boston Med. and Surg. Jour.*, 1888, cxviii., 29–57.

81. "The Medical College of Ohio before the War." Address to the Society of the Alumni of the Ohio Medical College, delivered at the annual commencement, March 7, 1888. *Cincin. Lancet-Clinic*, 1888, n. s., xx., 297–305.

82. "On Vital and Medical Statistics." The Cartwright lectures delivered before the Alumni Association of the College of Physicians of New York in November, 1889. *Med. Rec.*, N. Y., 1889, xxxvi., 589, 617, 645. *Also* Reprint.

83. "The Plans and Purposes of the Johns Hopkins Hospital." *Med. News*, Phila., 1889, liv., 505–510. *Also* Reprint.
84. "The United States Census in its Relations to Sanitation." *Am. Pub. Health Assoc. Rep.*, 1889, Concord, 1890, xv., 43–46. [Discussion] 243–246.
85. "Water Supply for Small Towns." *Engin. and Build. Rec.*, N. Y., 1888–9, xix., 235.
86. "House Drainage from Various Points of View." *Pop. Sc. Monthly*, N. Y., 1888–9, xxxiv., 310–324.
87. "Biographical Memoir of Spencer Fullerton Baird." (Read before the National Academy of Sciences, April 17, 1889.) *Nat. Acad. Sc. Biog. Mem.*, Wash., 1895, iii., 141–160. *Also* Reprint.
88. "Description of Johns Hopkins Hospital." Baltimore, I. Friedenwald, 1890. 3 p. l., 3–116 pp., 56 pl. 4°. (Johns Hopkins Hospital Publications.)
89. "The National Medical Dictionary": Including the English, French, German, Italian, and Latin Technical Terms Used in Medicine and the Collateral Sciences, and a Series of Useful Data. Edited by John Shaw Billings. With the collaboration of W. O. Atwater, Frank Baker, S. M. Burnett, W. T. Councilman, James M. Flint, J. H. Kidder, William Lee, R. Lorini, Washington Matthews, C. S. Minot, H. C., Yarrow. Philadelphia, Lea Bros. & Co., 1890. 2 vol. xlvi, 731 pp.; 1 p. l., 799 pp. Royal 8°.
90. "Vital Statistics of the Jews in the United States." Washington. D. C. [1890]. 19 p., 4 diagr. 4°. United States Census Office. 11th Census. Bulletin No. 19.
91. "The Relations of the Physicians of the United States to the Next Census." *Jour. Am. Med. Assoc.*, Chicago, 1890, xiv., 641–643. [Internat. ed.]
92. "Ideals of Medical Education." *Boston Med. and Surg. Jour.*, 1891, cxxiv., 619: cxxv., 1. *Also* Reprint. *Also: N. Engl. and Yale Rev.*, N. Haven, 1891, xix., 111–132. *Also* Reprint.
93. "Can the Reports of the Sick and the Sanitary Statements of the Different Armies be Arranged According to a Scheme Essentially Uniform for the Purpose of Gaining Statistics of Scientific Worth for Comparison of Diseases, Wounds, and Deaths in Times of Peace and War?" *Verhandl. d. X. Internat. med. Cong.*, 1890, Berl., 1891, v., 18. Abth. 107–134. *Also* Reprint.
94. "American Inventions and Discoveries in Medicine, Surgery, and Practical Sanitation." *Boston Med. and Surg. Jour.*, 1891, cxxiv., 349–351. *Also* Reprint.
95. "A Field Hospital at Gettysburg." *Youth's Companion*, Phila , July 2, 1891, 373.
96. "Modern Surgery." *Youth's Companion*, Phila., Oct. 15, 1891, 547.
97. "Public Health and Municipal Government." 23 pp. 8°. Suppl. to *Annals Amer. Acad. Polit. and Soc. Sc.*, Phila., 1891.

98. "Social Statistics of Cities." Washington, D. C., 1891. 27 pp. 4°. United States Census Office. 11th Census. Bulletin No. 100.
99. "Mechanical Methods Used in Compiling Data of the 11th United States Census; with an Exhibition of a Machine." *Proc. Am. Assoc. Adv. Sc.*, 1891, Salem, 1892, xl., 407–409.
100. "The Conditions and Prospects of the Library of the Surgeon-General's Office and of its Index-Catalogue." *Tr. Assoc. Am. Physic.*, Phila., 1891, vi., 251–257. *Also: Boston Med. and Surg. Jour.*, 1891, cxxv., 344–346. *Also: Med. News*, Phila., 1891, lix., 350–353.
101. "Vital Statistics of the Jews." *North Am. Rev.*, N. Y., 1891, cliii., 70–84.
102. "Addresses Delivered before the Mutual Aid Association of the Philadelphia County Medical Society for the Relief of the Widows and Orphans of Medical Men, December 14, 1892." By Drs. Billings, Keen, and Willard, and George D. McCreary, Esq. [Philadelphia] 1892. 11 pp. 8°.
103. "The Health of the Survivors of the War." *Forum*, N. Y., 1892, xii., 642–658.
104. "The Objects, Plans, and Needs of the Laboratory of Hygiene." An address delivered at the opening of the Laboratory of Hygiene of the University of Pennsylvania, Feb. 22, 1892. *Med. News*, Phila., 1892, lx., 230–236. *Also* Reprint. *Also* [Abstr.]: *Boston Med. and Surg. Jour.*, 1892, cxxvi., 181–184.
105. "St. Augustine: Report upon her Present Sanitary Condition." New York: Trow Directory, 1892. 7 pp. 12°.
—— The same. New York: J. B. Watkins, 1892. 7 pp. 8°.
106. "A Syllabus of the Lectures on Hygiene, Vital Statistics, etc., at the University of Pennsylvania." 1891–2. By John Shaw Billings and Alexander C. Abbott. Edited by Seneca Egbert. Philadelphia: Collins, 1892. 29 pp. 8°.
107. "The Causes of Outbreaks of Typhoid Fever." *Med. News*, Phila., 1892, lxi., 601.
108. "Prevalence of Consumption in the United States." *Tr. N. York Acad. Med.* (1892), 1893, 2. s., ix., 35–37.
109. "How Tom Kept Bachelor's Hall." *Youth's Companion*, Phila., November 10, 1892, 598–599.
110. "In a Draft Office." *Youth's Companion*, Phila., November 17, 1892, 610.
111. "A Condensed Statement of the Requirements of the Principal University Medical Schools in Europe with Regard to Candidates for the Degree of Doctor of Medicine." Baltimore, privately printed, 1893. 25 pp., printed only on one side. 8°.
112. "Hygiene." In: Pepper, W. *A Text-Book of Theory and Practice of Medicine.* Philadelphia, 1893–4, i., 1–45.
113. "Photomicrographs of Normal Histology, Human and Comparative, Prepared by Direction of the Surgeon-General." By John Shaw

Billings and William M. Gray. Washington, Gov. Prtg. Off., 1893. 2 p. l., 76 phot. fol.

114. "World's Columbian Exposition, Chicago, Ill., 1892–3. War Department Exhibit. Medical Department, United States Army. No. 5. Description of Microscopes from the Army Medical Museum, Washington, D. C." Chicago, 1893. 6 pp. 8°.

—— Same. Description of Selected Specimens from the Army Medical Museum, Washington, D. C. Chicago, 1893. 14 pp. 8°.

115. "Vital Statistics of the District of Columbia and Baltimore Covering a Period of Six Years Ending May 31, 1890." Washington, Gov. Prtg. Off., 1893. 3 p. l., 241 pp., 12 coloured maps. 4°. (United States 52d Cong. 1st Sess. House Misc. Doc., 340, Part 8.)

116. "The Relation of Hospitals to Public Health." *Hosp. Dispens. and Nursing, Internat. Cong. Char.* [etc.], 1893, Balt., 1894, 1–7. *Also in: Lend a Hand*, Boston, 1893, xi., 168–175.

117. "The Population of the Earth." *Chautauquan*, Meadville, Pa., 1892–3, xvi., 527–530.

118. "Effects of his Occupation upon the Physician." *Internat. Jour. Ethics*, Phila., 1893, iv., 40–48.

119. "Municipal Sanitation Defects in American Cities." *Forum*, N. Y., 1893, xv., 304–310.

120. "Medicine as a Career." *Forum*, N. Y., 1893, xiv., 725–734.

121. "Ventilation and Heating." N. Y.: The Engineer Record, 1893. xvi, 17–500 pp. 8°.

122. "Municipal Sanitation in Washington and Baltimore." *Forum*, N. Y., 1893, xv., 727–737.

123. "Municipal Sanitation in New York and Brooklyn." *Forum*, N. Y., 1893–4, xvi., 346–354.

124. "Bibliography (preliminary) of the Literature on the Physiological and Pathological Effects of Alcohol and Alcoholic Drinks." Edited for The Committee of Fifty for the Investigation of the Liquor Problem. Washington, D. C.: Judd & Detweiler, 1894. 28 pp. 8°.

125. "Hygiene in University Education." Address given to the University Extension Classes, Oxford, Engl., Aug. 7, 1894. *Boston Med. and Surg. Jour.*, 1894, cxxxi., 125–131. *Also* Reprint.

126. "The Bacteria of River Waters." Presenting a paper on the bacteria of the Schuylkill River by Dr. J. H. Wright. *Mem. Nat. Acad. Sc.*, 1894, Wash., 1895, vii., 417–421.

127. "The Influence of Certain Agents in Destroying the Vitality of the Typhoid and of the Colon Bacillus." By John Shaw Billings and Adelaide Ward Peckham. In: *Smithson. Inst. Rep.*, 1894, Wash., 1896, 451–458. *Also*: *Science*, N. Y., 1895, n. s., i., 169–174.

128. "The Influence of Light upon the Bacillus of Typhoid and the Colon Bacillus." *Mem. Nat. Acad. Sc.*, 1894, Wash., 1895, vii., 477–482.

129. "Methods of Teaching Surgery." *Boston Med. and Surg. Jour.*, 1894, cxxx., 535–538. *Also* Reprint.

130. "On the Influence of Insolation upon Culture Media and of Desiccation upon the Vitality of the Bacillus of Typhoid, of the Colon Bacillus, and of the Staphylococcus Pyogenes Aureus." *Mem. Nat. Acad. Sc.*, 1894. Wash., 1895, vii., 483–484.

—— Same. United States 53d Cong., 3d Sess., Sen. Misc. Doc., v. 3.

131. "Vital Statistics of New York City and Brooklyn, Covering a Period of Six Years Ending May 31, 1890." 53d Cong., 1st Sess., House Misc. Doc., 340, pt. 13. Washington, 1894, iv, 529 pp., 2 l., 12 maps. 4°.

132. "Speech at Meeting of the Harvard Medical Alumni Association." June 26, 1894. *Boston Med. and Surg. Jour.*, 1894, cxxxi., 140–142.

133. "Compulsory Notification of Tuberculosis." *Phila. Polyclinic*, 1894, iii., 73.

134. "A Report on the Etiology and Vital Statistics of Diphtheria and Croup." *Brit. Med. Jour.*, Lond., 1894, ii., 578.

135. "Water Supply and Sewage Disposal in Some Large European Cities." *Engin. and Build. Rec.*, N. Y., 1894, xxx., 395–397. *Also*: *Food*, N. Y., 1894–5, v., 187–196.

136. "The Health of Boston and Philadelphia." *Forum*, N. Y., 1894, xvii., 595–602.

137. "The Composition of Expired Air and its Effects upon Animal Life." [With a bibliography of 51 titles.] By J. S. Billings, S. Weir Mitchell, and D. H. Bergey. Washington, 1895. 81 p. 4°. *Smithson. Contrib. Knowl.*, Wash., 1895, xxix., No. 989. *Also* [Abstr.]: *Smithson. Inst. Rep.*, 1895, Wash., 1896, 389–412.

138. "The History and Literature of Surgery." *In: Syst. Surg.* (Dennis), Phila., 1895, i., 17–144. *Also* Reprint.

139. "Municipal Mortality Statistics." *Univ. Med. Mag.*, Phila., 1894–5, vii., 721–729. *Also* Reprint.

140. "Report of the Committee Appointed by the Smithsonian Institution to Award the Hopkins Fund Prizes." August 9, 1895. S. P. Langley, G. Brown Goode, J. S. Billings, and Mark W. Harrington. *Smithson. Inst. Rep.*, Wash., 1895, 13.

141. "Report on the Insane, Feeble-Minded, Deaf and Dumb, and the Blind in the United States at the Eleventh Census, 1890." Washington, Govt. Prtg. Off., 1895. xi, 1 l., 755 pp., 86 pl. 4°. (United States Census Office.)

—— Same. (United States 52d Cong., 1st Sess., House Misc. Doc., v. 50, pt. 16.)

142. "Report on the Social Statistics of Cities in the United States at the Eleventh Census: 1890." 52d Cong., 1st Sess., House Misc. Doc., 340, pt. 19. Washington, Govt. Prtg. Off., 1895. 137 pp., 1 chart, 33 diagr. 4°.

143. "Suggestions to Hospital and Asylum Visitors." With an Introduction by S. Weir Mitchell. By John Shaw Billings and Henry M. Hurd. Philadelphia: J. B. Lippincott Co., 1895. 48 pp. 16°.

144. "Vital Statistics of Boston and Philadelphia Covering a Period of

Six Years Ending May 31, 1890." Washington, Govt. Prtg. Off., 1895. vii, 229 pp., 12 maps. 4°.

145. "Waste." Address on Commencement Day of Miami University, Oxford, Ohio, June 20, 1895. Oxford, 1895. 19 pp. 8°.

146. The William Pepper Laboratory of Clinical Medicine. Address given at the opening of the Laboratory, December 4, 1895. [Philadelphia, 1895.] 15 pp. 8°.

147. "A Card Catalogue of Scientific Literature." *Science*, N. Y., 1895, n. s., i., 406–408.

148. [*Review.*] "Degeneration." By MAX NORDAU [New York, 1895]. *Science*, N. Y., 1895, n. s., i., 465–467.

149. [*Review.*] "The Climates and Baths of Great Britain." Vol. i. [London, 1895.] *Science*, N. Y., 1895, n. s., ii., 454–455.

150. "Report on Vital and Social Statistics in the United States at the Eleventh Census: 1890." Part 1–4. Washington, Govt. Prtg. Off., 1894–1896. 4°. (United States Census Office.)

151. ——Same. (United States 52d Cong., 1st Sess., House Misc. Docs., v. 50., pt. 18.)
Part 1. "Analysis and Rate Tables." 1896, xvii, 1059 pp.
Part 2. "Vital Statistics. Cities of 100,000 Population and Upward." 1896, ix, 1181 pp.
Part 3. "Statistics of Deaths." 1894, v, 1050 pp.
Part 4. "Statistics of Deaths." 1895, v, 1033 pp.

152. "The King's Touch for Scrofula." *Proc. Charaka Club*, N. Y., 1896, ii., 57–71.

153. "The Influence of the Smithsonian Institution upon the Development of Libraries, the Organization and Work of Societies, and the Publication of Scientific Literature in the United States." (In *Smithsonian Institution*, 1846–1896, The History of its First Half Century. Washington, 1897, pp. 815–822. 4°.)

154. "Some Ideas in Hospital Construction. Report Made to the Memphis City Council upon Plans Proposed for the New City Hospital." *Memphis Med. Monthly*, 1897, xvii., 193, 249, 309.

155. "Progress of Medicine in the Nineteenth Century." *Smithson. Inst. Rep.*, 1900, Wash, 1901, 637–644. *Also* Reprint.

156. "The Card Catalogue of a Great Public Library." *Library Jour.*, N. Y., 1901, xxvi., 377.

157. "Address Delivered at the Dedication of the New Building of the Boston Medical Library, January 12, 1901." *Boston Med. and Surg. Jour.*, 1901, cxliv., 61–63. *Also* Reprint.

158. "Biographical Memoir of Francis Amasa Walker, 1840–1897." (Read before the National Academy of Sciences, April 17, 1902.) *National Academy of Sciences. Biographical Memoirs.* Wash., 1902, v., 209–218.

159. "Some Library Problems of To-morrow." President's Address to the American Library Association, June 17, 1902. *Library Jour.*,

N. Y., 1902, xxvii., No. 7, 1–9. *Also in: Papers and Proceedings of the 24th General Meeting of the American Library Association*, 1902, 1–9.

160. "The Military Medical Officer at the Opening of the Twentieth Century." Address to the graduating class of the Army Medical School at Washington, April 14, 1903. *Jour. Assoc. Mil. Surg. U. S.*, Carlisle, Pa., 1903, xii., 349–358. *Also* Reprint.

161. "Relations of Drink Habits to Insanity." *In: Physiol. Aspects Liquor Problem*, Boston and N. Y., 1903, i., 339–355.

162. "Data Relating to the Use of Alcoholic Drinks among Brain Workers in the United States." *In: Physiol. Aspects Liquor Problem*, Boston and N. Y., 1903, i., 307–338.

—— *Physiological Aspects of the Liquor Problem:* Investigations Made by and under Direction of W. O. Atwater, J. S. Billings, H. P. Bowditch, R. H. Chittenden, and W. H. Welch. Boston: Houghton, Mifflin & Co., 1903. 2 vols. 8°.

163. "The Public Library: Its Uses to the Municipality." *Library Jour.*, N. Y., 1903, xxviii., 293.

164. "A Discussion of the Vital Statistics of the Twelfth Census." Washington, Govt. Prtg. Off., 1904. 24 pp. 4°. United States Census Bureau, Bulletin 15.

165. "The Carnegie Institution." *Jour. Am. Med. Assoc.*, Chicago, 1904, xlii., 1674.

166. *The Liquor Problem. A Summary of Investigations Conducted by the Committee of Fifty, 1893–1903.* Prepared for the Committee by J. S. Billings, C. W. Eliot, and others. Boston: Houghton, Mifflin & Co., 1905, ix, 182 p. 12°.

167. "A Summary of Investigations Concerning the Physiological Aspects of the Liquor Problem." (*In: The Liquor Problem. A Summary of Investigations Conducted by the Committee of Fifty, 1893–1903*, 1905. pp. 15–42.)

168. "Medical Reminiscences of the Civil War." *Tr. Coll. Phys. Phila.*, 1905, 3 s., xxvii., 115–121.

169. "Address Given at the Opening of the New Library Building at Radcliffe College, Cambridge, April 27, 1908." *Radcliffe Mag.*, Cambridge, 1908, x., 107–111.

170. "Public Library Systems of Greater New York." *Library Jour.*, N. Y., 1911, xxxvi., 489–492.

171. "The New York Public Library." *Century*, N. Y., 1911, lxxxi., 839–852.

CENTRAL RESERVE
5TH AVE. & 42ND ST., ROOM 100

INDEX

Abbe, Robert, 325
Abbot, Edward Stanley, 132–133
Abbot, Edwin H., 133
Abbot, Henry L., 132–133, 156
Abbott, Alexander C., 209, 279, 341
Abbott, Robert O., 112, 150
Abel, John J., 211
Abercrombie, John J., 95
Acland, Miss Sarah, 270, 294, 306, 316; reminiscences, 387–390
Acland, Sir Henry W., 165, 166, 231, 243, 253, 270–271, 272, 273–274, 280–281, 293, 294, 301, 387, 392
Acland, Sir Thomas Dyke, 253
Adams, Samuel, 21, 104, 106
Agassiz, Louis, 216
Alcoholism, 270, 317
Aldie Gap, Va., 49, 56, 57, 60
Allbutt, Sir Thomas Clifford, 294, 315
Allen, Tom, 6–7, 134–135
American Library Association, 304, 318
American Medical Association, 259–263
American Museum of Natural History, 351
American Public Health Association, 161, 172–176
Anderson, Edwin H., 297, 321, 324, 329, 382
Anderson, Sir R. Rowand, 250
Aquia Creek, Va., 36, 48, 67, 88, 94
Army Medical Museum, 114, 261–262, 263–266, 339, 380, 381
Army Medical School, 318; address at, 371–372
Army of the Potomac, 20, 30–67, 71, 73–135
Arnold, Matthew, 167–168, 220, 359, 383
Asch, Morris J., 90, 112
Ashhurst, Mr., 231
Astor, John Jacob, 288
Astor, William B., 288
Astor Library, 289, 291, 299, 307, 315
Atwater, Wilbur Olin, 268, 312
Avery, Samuel P., 314
Ayres, Romeyn B., 104

Babcock, Orville E., 95
Bach, J. S., 277
Bacon, Cyrus, 43, 63
Bacon, Dr. Francis, 191
Bacon, Lord, 390
Bailhache, Preston H., 162
Baird, Spencer F., 345
Baker, Frank, 268
Balfour, Arthur, 348
Balzac, 385
Bancroft, George, 143
Banks' Ford, 50
Baretta, M., 264
Barker, Fordyce, 248, 249, 252
Barker, George F., 351
Barker, Lewellys F., 209, 211
Barlow, Francis C., 83, 107
Barnard Medal Fund, 345
Barnes, Joseph K., 76, 86, 87, 92, 93, 100, 112, 138, 140, 142, 181, 213, 228
Barnes Hospital, D. C., 160, 339
Bates, John C., 110
Battey, Robert, 256
Battlesden Abbey, 1
Baudouin, Marcel, 227
Bayard, Thomas F., 293
Bayley, William A., 28
Beaconsfield, Lord, 385
Beale, Edward F., 195
Beale, Lionel S., 143, 144
Beck, Marcus, 194
Beck, T. Romeyn, 168
Bedloe's Island, N. Y. H., 70, 71, 107

Belle Plain, Va., 82, 84, 89
Benet, Larry, 295
Benson's Mills, Va., 50, 60
Bentham, Jeremy, 175
Bergey, David H., 279
Berkley, Henry J., 275
Berlin, University of, 216
Bernard, Claude, 142, 235
Beverly Ford, Va., fight at, 52, 57
Bibliothèque Nationale, Paris, 289, 316
Bigelow, John, 290, 295, 303, 320–321
Billing, Ebenezer, 1, 404, 405
Billing, John, 402
Billing, Nicholas, 401
Billing, Richard, 1, 403
Billing, Sir Thomas, 1, 398–399
Billing, William, 12, 40
Billing, William (II), 403
Billings, Emma, 2, 59, 406, 407
Billings, Frank, 263
Billings, James, 2, 406, 407
Billings, Mrs. James, 32, 59, 406, 407
Billings, Jesse, 2, 405
Billings, Jessie Ingram. *See* Hartley, Mrs. Bradfield.
Billings, John Sedgwick, 81, 304, 329, 406
Billings, John Shaw, birth, 2; autobiographical sketch, 2–4; preliminary education, 4–8; Latin salutatory, 5; medical education, 8–18; graduating dissertation, 14–17; appointed Assistant Surgeon, U. S. Army, 19–20; Civil War experiences, 19–135; marriage, 23; letters to Mrs. Billings, 23–27, 29–30, 31–41, 42–45, 46–60, 64–66, 67–71, 75–127, 228–232, 245–247, 253, 263, 272, 274–275, 292–296, 300–301, 304–316; surgical work, 16–22, 27, 40–42, 60–67, 86, 128, 130, 336; transferred to Surgeon General's Office, 127, 135; official life in Washington, 135–277; Oriental studies, 138; diary of 1866, 141–150; report on Texas fever, 150–152; studies on fungi, 152–153; inspects and reorganizes Marine Hospital Service, 153–154; reports on barracks, hospitals and U. S. Army hygiene, 154–161; invents heating apparatus, 155, 160; devises *questionnaire* for American Public Health Association, 161–162; becomes Vice-President National Board of Health, 162–166; *A Century of American Medicine*, 166–172; Presidential address, American Public Health Association, 172–176; yellow-fever epidemic at Memphis, 176–177; essay on yellow fever, 177–180; work on the Johns Hopkins Hospital, 181–212; European trip (1876), 191–197; work on the Surgeon-General's Library and Catalogue, 213–277; International Medical Congress (London), 227–244, Address, 232–242; honors, 247–248, takes Edinburgh LL.D., 248–250; address to British Medical Association, 252–259; contretemps of International Medical Congress (Washington), 260–263; Army Medical Museum, 263–266; Philadelphia, 278–287; testimonial banquet, 282–286; portrait by Cecilia Beaux, 286–287; work on New York Public Library, 288–335; fortitude in illness, 324–328; death and burial, 328–329; descendants, 329; memorial tributes, 329–335, 393–395; Scientific work, 336–358; President Woodward's reminiscences, 348–356; literary work, 267–270; 358–375; character and personality, 376–395; Miss Acland's reminiscences, 387–390; genealogy, 396–407; military record, 408–410; bibliography, 411–422
Billings, Mrs. John Shaw, marriage, 23; letters to, 23–27, 29–30, 31–41, 42–45, 46–60, 64–66, 67–71, 75–77, 80–127, 228–232, 245–247, 253, 263, 272, 274–275, 292–296, 300–301, 304–316; prepares Billings's genealogy, 396; death, 320; character, 327–329
Billings, Kate Sherman. *See* Wilson, Mrs. William Hanna.
Billings, Margaret Janeway, 229–230, 329, 406
Billings, Mary Clare. *See* Ord, Mrs. William Wallis.
Billroth, Theodor, 336
Bismarck, 366, 387
Black, William, 272

Blackman, George C., 9, 10, 12, 13, 16, 18, 19
Blake, William, 150
Bland, Dr., 101
"Bloody Angle," The, 84–87
Blumenbach, J. F., 338
Boerhaave, Hermann, 338
Bonham, John C., 4, 5
Bowditch, E. W., 204
Bowditch, Henry I., 162, 191
Bradford, Augustus W., 119
Bradley, Sergeant, 94
Brady, M. B., 108, 131
Braidwood, Peter Murray, 229
Brandy Station, Va., 74–75
di Brazza, Count, 310
Breneman, Edward De W., 61, 94
Brightly, Charles H., 89
Brinton, Jeremiah B., 62, 76, 80, 82
Brinton, John H., 87, 140
Bristoe Station, Va., 53
British Library Association, 309
British Medical Association, address before, 252–262
British Museum, 224, 225; library of, 289, 316
Brown, F. Tilden, 325
Brown, Harvey, 68
Bruce Library, N. Y., 304
Brunton, Sir Thomas Lauder, 192, 193, 293, 294, 315, 377–378
Bryant, Thomas, 272
Bryant Park reservoir, 291, 296, 297, 298
Burdett, Sir Henry, 294, 326–327, 393
Burdon Sanderson, Sir John, 184, 194
Burgers [*or* Burges], Tristram, 2
Burnett, Swan M., 268
Burnside, Ambrose E., 73, 75, 76, 78, 79, 80, 82, 94, 95, 97, 111, 122, 123, 124
Burton, Henry S., 95, 123
Busey, Samuel C., 305
Butler, Benjamin F., 73

Cabell, James L., 162
Cabot and Chandler, 200
Cadwalader, John L., 281, 290, 296, 300, 304, 305, 306, 316, 320, 321, 329, 330, 331–332, 354, 392, 394
Caldwell, Daniel G., 149
Callisen, A. C. P., 338
Campbell, Henry Fraser, 256
de Candolle, Alphonse, 258
Cannon, Joseph G., 313
Carlyle, Thomas, 39, 362
Carnegie, Andrew, 302–303, 306, 316, 321, 330–331, 347–356, 385, 393
Carnegie Institution of Washington, 227, 263, 310, 311, 313, 316, 382, 383, 384
Carrère and Hastings, 297, 299, 303, 308
Carrère, John Merven, 298
Cascapedia Club, 300
Catlett's Station, Va., 49, 60
Celsus, 16
Census, U. S., 251, 269, 308, 343
Centreville, Va., 49, 53, 54, 60
Century (A) of American Medicine, 166–172
Century Club, N. Y., 309
Chadwick, James R., 252, 284–285, 294, 295, 386
Chaillé, Stanford E., 163
Chancellorsville, Va., 77, 78; Battle of, 30, 40–42, 58, 130
Chandler, Charles F., 163
Chandler, Francis Ward, 317
Charaka Club, N. Y., 317
Charles City Court House, Va., 109, 110
Chase, Salmon P., 115
Cheeseborough, William, 1
Chickahominy River, Va., 107, 109, 110
Chiene, John, 294
Cholera, bibliography of, 166
Choulant, Ludwig, 337, 338
Circular No. 4, 155–158
Circular No. 8, 158–161
City Point, Va., 112, 113, 114, 117, 118, 119, 125, 126, 127
Civil War, 18, 19–135, 320, 336
Clark, Sir Andrew, 249, 272
Clements, Bennett A., 30
Clendenin, William, 12
Clerk Maxwell Club, 349
Cliffburne Hospital, D. C., 22–28, 64, 107, 130
Clifford, W. K., 373
Clinton, William, 55
Cohnheim, Julius, 207
Cold Harbour, assaults at, 98–104
Coler, Bird S., 301
Colcridge, S. T., 148
College of Physicians of Philadelphia, 320, 370
Collins, Wilkie, 387
Committee of Fifty, 317

Concilium Bibliographicum Zoölogicum, 311
de Condillac, l'abbé E. B., 239
Congress of American Physicians and Surgeons, 264–265
Conner, Philetus S., 13
Corfield, William H., 194
Cornarius, Janus, 333
Cossins House, Va., 83, 88
Coues, Elliott, 145
Councilman, William T., 209, 210, 211, 268
Counting machine, 343
Craig, Robert O., 34
Craik, Dinah Muloch, 143, 229
Crane, Charles F., 143, 146, 149
Craniography, 250–251, 252, 345
Crowe, Samuel J., 211
Crowley, Samuel T., 97, 106
Cruger, S. V. R., 290
Cullen, Thomas S., 209
Culpeper Court House, Va., 74, 75, 76
Cunningham, Daniel John, 264
Curie, Mme. Marie, 310
Curie, Pierre, 310
Curtis, Edward, 46, 60, 71, 138, 143, 145, 148, 150–152
Curtis, Edward M., 47, 58, 67, 69
Curtis, George E., 349
Cushing, Harvey, 211
Cuyler, John M., 89

Da Costa, Jacob M., 282–283
Dalton, Edward B., 81, 87, 95
David's Island, N. Y. H., 70
Davis, George S., 227
Dawson, W. W., 18
Day, Miss, 310
De Camp General Hospital, N. Y. H., 70
Dent, Frederick T., 75
Deserted House, The, 90
Dewey, Melville, 224
Dick (Dr. Billings's horse), 33, 34, 38, 40, 48, 50, 54, 55, 57, 65, 71
Dieffenbach, J. F., 336
Dix, John Adams, 55, 71
Dix, John Alden, 321
Dohrn, Anton, 311
Dongan Charter, 296
Doré, Gustave, 142, 147
Dougherty, Alexander V., 78, 86, 122
Draft Riots, 67–68
Drake, Daniel, 8, 9, 10, 11, 161, 168
Draper, Henry, 333
Draper, Mrs. Henry, 333, 342
Drum, Richard C., 227
Dublin, University of, Tercentenary of, 271
Du Bois, Henry A., 95
Du Bois-Reymond, Emil, 234
Dunn, William McK., 109
Dyron, Thomas, 94

Early, Jubal A., 98
Edgerton, Frank, 328
Edinburgh, University of, 248–250
Education, Medical, 184–191, 198, 256
Edwards' Ferry, Va., 49, 58, 60
Eger, Miss Bertha, 311
Einthoven, Willem, 239
Eliot, Charles W., 212, 310, 325–326, 383
Elliott, Charles, 8
Ellsworth, Ephraim E., 67
Emerson, Charles P., 209, 211
Emerson, Ralph Waldo, 11, 222, 378, 383
Epilepsy, Thesis on, 15, 16–17, 142
Erichsen, John Eric, 192, 193, 229
von Esmarch, Baroness, 266
von Esmarch, Friedrich, 266
Ether Day, 325
Ewald, Carl Anton, 312
Ewell, Richard S., 77, 91, 116, 117, 118

Farley, John, *Cardinal*, 321
Farr, William, 226, 342
Fayrer, Sir Joseph, 194
Fergusson, Sir William, 10
Ferrier, David, 194
Fessenden, William Pitt, 115, 124
Fichte, Joh. Gottlieb, 216
Field, Haviland, 311
Fifth Corps, 60–66, 76, 77, 78, 80
Finley, Clement A., 20
Fletcher, Robert, 133, 218–219, 220–221, 222–223, 225–227, 266, 275, 276, 277, 285–286, 325, 339, 354, 381, 387
Flexner, Abraham, 203, 342
Flexner, Simon, 209, 210, 211
Flint, Austin, 143, 228, 229, 252, 253, 260
Flint, James M., 268
Floyd-Jones, De Lancey, 35, 46, 150
Folsom, Charles F., 163, 176, 309
Folsom, Norton, 183
Ford's Theatre, 214

Fort Schuyler, N. Y. H., 68–70, 123, 156
Foster, Sir Michael, 197, 235
Fox, Della, 293
Frederick, Md., 49, 58, 59, 60, 65
Fredericksburg, Va., 35, 40, 42, 51, 52, 80, 82, 84, 86, 87, 89, 92, 93, 95
Frémont, John C., 37
von Frerichs, Friedrich Theodor, 235
Froude, James Anthony, 377

Gage, Lyman J., 348
Galton, Sir Francis, 250
Gamgee, Arthur, 312
Gamgee, John, 150
Gamp, Sairey, 57
Garfield, James A., 229, 247
Garrett, John W., 201
Garrick, David, 386
Gaskell, Mrs., 144
Gaynor, William J., 321
Geikie, Sir Archibald, 272
Geophysical Laboratory, 355
Geraghty, John T., 211
Gerhard, William W., 168
Germanna Ford, Va., 77, 79
Gesner, Brower, 143
Gesner, Conrad, 337
Getty, George W., 78
Gettysburg, Battle of, 60–67, 130, 132–133
Ghiselin, James T., 86, 90, 95, 103, 105, 116, 118, 121
Gibbon, John, 88, 113
Gibbs, George, 145
Gibson, Joseph R., 111
Gilchrist, Thomas C., 211
Gillespie, George L., 111
Gilman, Daniel C., 203, 207, 347, 348, 352
Godman, John D., 11, 168
Goethe, 212, 360, 385
Goldsmith, Oliver, 386
Graham, James, 9, 10, 11, 12, 18
Grant, U. S., 73–74, 75, 77, 80, 87, 91, 94, 95, 107, 109, 126, 145
Graves, Robert, 239
Green, Bernard L., 297
Greenleaf, Charles R., 147
Greer, Bishop, 321
Gregg, David McM., 77, 114
Gregoor, Servaas, 313
Gross, Samuel D., 167, 249, 388
Guiney's Station, Va., 93
Guiteras, John, 163
Gull, Sir William, 229, 249
Gum Springs, Va., 49, 54, 55, 60
Guthrie, Edward A., 84
Guy (Dr. Billings's horse), 24, 25, 57
Gwin, Charles J. M., 203

Haeser, Heinrich, 337, 338, 357
Hain, Ludwig, 337, 338
Hall, J. W., 8
Hall, John, 228
Halleck, Henry W., 49
von Haller, Albrecht, 216, 336, 337, 338
Hallier, Ernst, 151
Halsey, Frederick R., 329
Halsted, William S., 209, 210, 271, 324–325, 329, 332
Hamilton, Sir William, 148
Hammond, William A., 22, 213, 263
Hancock, Winfield S., 80, 83, 84, 85, 87, 88, 92, 95, 97, 107, 109, 111
Hannover, Pa., 60, 61, 66
Hanover Court House, Va., 98
Hardie, T. S., 163
Harrison, Charles G., 281
Hart, Ernest, 192
Hartley, Mrs. Bradfield, 329, 406
Hartwood Church, Va., 39
Harvard University, 317; Medical School, 309
Hasse, Adelaide R., 411
Hastings, Thomas, 298
Haw's Shop, Va., 97, 98
Hay, John, 129–130, 347
Hayes, Isaac I., 29, 139
Hays, I. Minis, 260
Heger, Anthony, 149
von Helmholtz, Hermann, 237–238, 374
Helsby, Thomas H., 32, 49
Hewitt, Abram S., 348
Hibberd, James F., 18
Hichborn, Alexander, 38, 43, 44, 47
Hill, Ambrose P., 77
Hippocrates, 16, 239, 359, 373
His, Wilhelm, 264
History of Surgery, 274, 357
Hitchcock, Ethan A., 138, 146, 147, 148
Hollerith, Herman, 343
Holman, Silas A., 79, 81, 85, 86, 90, 100, 103
Holmes, Oliver Wendell, 191, 216–218, 359, 377, 383
Hood, John B., 60

Hooker, Joseph, 30, 31, 32, 33, 36, 37, 38, 41, 45, 49, 50, 51, 52, 56, 57, 58, 59, 76
Hopkins, Johns, 181, 182, 183, 186, 190, 204
Hospital Construction, 155–157, 181–212, 316–317
Hospitals, military, 155–157, 160
Howard, Benjamin, 64
Howard, Herbert B., 317
Howland, John, 2
Hume, David, 39
Humphreys, Andrew A., 95
Hunt, Ezra M., 191, 193, 387, 388
Hunt, Henry J., 95, 96, 103
Hunter, David, 109, 121
Hunter, John, 169, 336, 337, 357, 358, 367, 373
Hunterian Museum, 264, 265
Hurd, Henry M., 201, 207, 211, 270, 275, 332, 386, 387
Huxley, Thomas Henry, 194, 373
Hygiene, Public, 340–342
Hypodermic syringe, 16–17, 20

Ile à Vache, expedition to, 71–73
Index Catalogue, 166, 218–225, 236–237, 272, 284, 311, 334, 336, 337–339
Index Medicus, 225–227, 284, 334, 339, 354
Index of Scientific Literature, 291
Ingalls, Rufus, 92, 93, 94, 95
Ingelow, Jean, 192
Ingram, Alexander, 60; letter to, 139–141
International Bibliographic Institute (Brussels), 309
International Medical Congresses, London (1881), 223, 227–228, 232–244; Washington (1887), 260–262; Berlin (1890), 271
Iroquois Theatre (Chicago), fire at, 313
Irving, Sir Henry, 272

Jackson, "Stonewall," 45, 133
Jacobi, Dr. Abraham, 219, 261, 263, 393, 394
James, Henry, 212, 378, 395
James River, Va., 106, 109, 110, 111, 114, 115
Jericho Mill, 95, 96
Johns Hopkins Hospital, 157, 181–212, 339, 383, 384, 392, 393
Johns Hopkins University, 248
Johnson, Andrew, 142, 144, 147, 149
Johnson, Edward, 85
Johnson, Samuel, 283
Johnston, Joseph E., 123
Jones, Captain, 86–87
Jones, John, 167
Jones, Joseph, 183
Jones, Thomas, 89
Jonson, Ben, 193, 377
Judkins, Jesse P., 12
Juettner, Otto, 10, 13

Kaulbach, Friedrich, 246–247
Keen, William W., 20, 320
Kelly, Howard A., 209, 210, 211
Kelly's Ford, Va., 40
Kennedy, John S., 290
King, Francis T., 181, 184, 203, 204, 229, 230
King, William A., 308
King's Evil, 317
Koch, Robert, 152, 235, 280
Kock, Bernard, 72–73
Koester, Francis J., 410
Kronecker, Hugo, 311–312

Laboratory of Hygiene (Philadelphia), 271, 279, 339
Lafleur, Henry A., 209, 211
Lamb, Daniel Smith, 264
Langley, Samuel Pierpont, 294, 374
La Roche, R., 242
Laub, Charles H., 143
Lawson, B. S., 12
Lea, Henry C., 278–279
Ledyard, Lewis Cass, 290
Lee, Charles C., 87
Lee, Robert E., 30, 44, 47, 48, 49, 50, 54, 55, 58, 59, 65, 74, 77, 94, 104, 107, 112, 209
Leesburg, Va., 49, 54, 58, 60
Leidy, Joseph, 29
Leigh, John, 167
Lenox, James, 288
Lenox Library, 289, 291, 299
Letterman, Jonathan, 22, 30, 107, 127
Letters to a Young Architect, 341
Levi, Eliphaz, 147, 148
Lewis, F. W., 29
Leypoldt, F., 226
Libraries, medical, 15–16
Library of Congress, 214, 304, 309, 315
Lidell, John A., 139, 143
von Liebig, Justus, 194

Lincoln, Abraham, 32, 36, 72–73, 118, 124, 143, 214
Lister, Lord, 130, 157, 197, 199, 229, 358
Little Round Top, assault on, 60, 61
Littré, Émile, 359
Lockyer, Norman, 193, 194, 272
Long Bridge, Va., 109
Longmore, Sir Thomas, 243
Longworth's "Golden Wedding" (Wine), 12
Lovell, Joseph, 213
Low, Seth, 320
Lowe, William B., 86
Lowell, James Russell, 193, 248, 395
Lydenberg, H. M., 314, 328

MacAlister, J. Y. W., 333–335
McBurney, Charles, 325
McCaw, Walter D., 277, 392, 393
McClellan, George B., 98
McCool salient, assault on, 84–87
MacCormac, Sir William, 194, 227, 243, 244, 293
McCormick, Charles, 112
McCulloch, Champe C., Jr., 277
McDonald, John E., 96
McDougall, Charles, 69
McDougall General Hospital, N. Y. H., 68–70
McDowell, Ephraim, 256
McEwen, Dr., 229
McFarland, Hospital steward, 86
MacFarland, R. W., 8
McGill, George M., 33, 57, 99, 100, 101, 110, 111, 121, 126, 140, 149
McGuigan, Dr., 97
McGuire, Hunter, 133
MacKenzie, Thomas G., 83, 112
McLaren, Adam Neil, 20
MacMahon, Father, 314
McMahon, Martin T., 106
McParlin, Thomas A., 74, 83, 89, 93, 105, 108, 122, 125, 126, 127, 128
Mahan, Alfred T., 314
Maitland, Alexander, 290
Mall, Franklin P., 210
Manassas Junction, Va., 49, 53–54, 60
Mansfield, Colonel, 88
Marsh, George P., 346
Martin, H. Newell, 208
Martin, James P., 49
Massachusetts General Hospital, 325
Massachusetts Institute of Technology, 317
Massaponax Church, Va., 93
Massaponax Court House, 87
Matthews, Washington, 250, 252, 345
Mead, Sergeant, 125
Meade, George G., 30, 36, 49, 58, 59, 73, 74, 76, 79, 80, 81, 84, 86, 87, 88, 90, 91, 95, 102, 104, 109, 111, 121, 122
Medical College of Ohio, 8–18
Medicine, history of, 202
Medicine, military, 245
Meigs, Montgomery C., 93
Memphis, Tenn., yellow fever at, 176–177
Mendenhall, George, 12
Merchant, Charles S., 71
Merrill, James Cushing, 277
Miami Medical College, 9
Miami University, 4, 5–8
Michler, Nathaniel, 123–124
Milhau, John J., 62, 84, 85, 87, 88, 97, 102, 104, 106, 122
Milk-sickness, 168
Mill, John Stuart, 373
Mine Run, Va., 74
Minot, Charles S., 268
Mitchell, Edward Kearsley, 131–132, 330
Mitchell, John K., 151, 168
Mitchell, Langdon Elwyn, 272
Mitchell, S. Weir, 11, 60, 131–132, 268, 270, 272, 279, 282, 283, 300, 301, 305–306, 308, 320, 325, 329, 330, 336, 337, 348, 354, 359, 361, 377, 382, 383, 390, 391, 392, 394
Monocacy Junction, Md., 59
Moore, W. Withers, 252
Morgan, J. Pierpont, 306, 313
Morris, Casper, 183
Morton, Samuel G., 168
Mosby, John S., 87
Moultrie, John, 249
Muloch, Miss. *See* Craik
Munich, University of, 284
Munro, A. R., 86
Murray Hill Reservoir. *See* Bryant Park Reservoir

Napoleon, 216, 385
National Academy of Sciences, 316, 345
National Board of Health, 162–166
National Medical Dictionary, 268–269

National Museum, U. S., 346
Nélaton probe, 84
Nell (Dr. Billings's orderly), 48, 50, 51, 52, 53, 55, 58, 59, 60, 67, 69
Newhall, Frederick C., 114
Newton, Mrs., 97
New York Academy of Sciences, 350–351
New York Public Library, 281, 288–335, 339, 381, 382, 393
Nicolay, John G., 129–130
Niernsée, John R., 197
Nightingale, Florence, 156, 199
North Anna, battle of the, 94–95
Norton, Rupert, 211
Notter, J. Lane, 293
Nutrition Laboratory, 354
Ny River, Virginia, 89, 90, 91

Ochiltree, Thomas, 293
O'Connell. *See* Sister Anthony
O'Leary, Charles, 18
Opie, Eugene L., 210
Ord, William M., 229, 391
Ord, William Wallis, 329
Ord, Mrs. William Wallis, 329, 395, 406
O'Reilly, Robert Maitland, 308
Osler, Sir William, 208, 209, 210, 211, 263, 286, 287, 329, 337, 359, 379, 393
Otis, George A., 138, 147, 213, 243

Packard, John H., 66
Page, Walter H., 273
Pagel, Julius, 394
Paget, Sir James, 231–232, 241–242
Pamunkey River, Va., 97, 98, 99
Parker, Ely S., 91
Pasteur, Louis, 152, 157, 248
Patrick, Marsena R., 79, 87
Peabody Library (Baltimore), 225
Peach Orchard, The, 60
Pearson, Karl, 342, 343
Pease, Roger R., 84, 86, 117
Peck, John J., 55
Peckham, Adelaide Ward, 279
Pepper, George S., 279
Pepper, William, 212, 278, 279, 282, 383
Perry, Dr., 149
Peter Bent Brigham Hospital, 317, 320
Petersburg, siege of, 110–127
von Pettenkofer, Max, 201, 249, 280, 342
Phelps, Alonzo J., 89, 90
Phillips, Wendell, 393
Philosophical Society, 348–349
Phipps, Henry, 211
Piney Branch Church, Va., 81, 83
Pirogoff, N. I., 336
Plato, 238
Pleasanton, Alfred, 57, 59
Porter, Hampden, 113, 114, 120, 121, 122, 146
Porter, Horace, 145
Potomac Creek, 31–32
Prince of Wales, 229
Putnam, Herbert, 304, 309, 312

Quarantine, 163, 164, 165

Radcliffe College, Cambridge, 318
Ramsey, William R., 31, 32, 34, 35, 36, 37, 38, 40, 46, 47, 63, 64, 65, 66, 68, 133, 147
Rapidan River, Va., 40, 77
Rappahannock River, Va., 39
Rations, 159
Rawlins, John A., 95
Ray, Isaac, 168
Reed, Walter, 179, 210, 277
Reeve, John C., 18
Reid, Whitelaw, 316
Renan, Ernest, 360
Revon, Michel, 292
von Reyher, Carl, 245
Rice, Charles, 223
Richard (Dr. Billings's orderly), 33, 36, 38, 40
Richet, Charles, 227
Ricketts, James B., 117
Riggs's Bank, 214, 215
Ring, Dr., 228
Rives, George L., 290, 321
Robertson, Dr., 113
Robinson's Tavern, Va., 88
Rockefeller, John D., 212
Rockwell and Churchill, 227
Rodgers, John, 328
Rokitansky, Carl, 142
Root, Elihu, 314, 329, 330, 348
Rosecrans, William S., 33
Rosser, Thomas L., 92
Roth, Wilhelm August, 194
Round Table Club, 300
Roussin, Z., 123
Rowntree, Leonard G., 211
Royal College of Physicians, 163
Royal College of Surgeons, 264, 265
Rush, Benjamin, 167
Ruskin, John, 247, 258

St. Mary's Church, fight at, 114
Sanitary Commission, U. S., 62, 66
Satterlee Hospital (West Philadelphia), 28–30, 34, 66, 68, 107
Sayre, Louis A., 260
Schafhirt, Ernest F., 144
Schenck, Benjamin R., 21
Schiff, Dr., 92
Schiff Fund, 300
School of Mines, lectures at, 272, 279
Schriver, Edmund, 82, 84, 102, 106
Schuyler, Philip, 303
Schuylkill River, 280
Scott, Winfield, 75, 148, 149
Sedgwick, John, 78, 80, 81, 82, 89
Semmelweis, Ignaz, 157
Semmes, Raphael, 73
Seven Days before Richmond, 27–28
Shakespeare, 146, 360
Sharp, Dr., 100
Shaw, Abby, 2
Shaw, Charles 3
Shaw, Edward, 222
Shaw, William Henry, 3
Sheridan, Philip H., 74, 80, 109, 115
Sherman, William T., 123, 124, 125, 227
"Shorty," 55
Sickles, Daniel E., 60
Sigel, Franz, 44, 116
Simon, Sir John, 227, 229
Sims, J. Marion, 167, 256
Sinclair, James B., 84
Sister Anthony, 12, 13–14, 140
Slack, Elijah, 9
Slocum disaster, 313
Smart, Charles, 86
Smedberg, Charles G., 48
Smith, Alan P., 201
Smith, Charles Stewart, 304
Smith, Jesse, 9
Smith, Joseph T., 203
Smith, Nathan R., 64, 106
Smith, Stephen, 162, 183
Smith, William F., 98, 100, 124
Smith, Winford H., 211
Smithsonian Institution, 3, 345–347
Smyth, Andrew Woods, 264
Solar Observatory, 354
Spanish-American War, 301
Specimen Fasciculus, 166, 215, 216
Spencer, Herbert, 147
Spencer, T. Rush, 100, 139
Spenser, Edmund, 146
Spinoza, 138, 148, 363
Spottswood Hospital, 80
Spottsylvania Court House, Va., 80–89; fight at, 82–83
Stanton, Edwin M., 36, 142
Statistics, vital, 343–344
Stedman, Edmund Clarence, 309
Sternberg, George M., 163, 210
Stevens, Hester L., 23, 45, 76, 85
Stevens, Kate M. *See* Billings, Mrs. John Shaw
Stevens, Robert, 119
Stevenson, Robert Louis, 368
Stoddard, Richard Henry, 309
Stone, Frederick W., 152
Stover, Martin L., 321
Stuart, J. E. B., 80, 88
Suckley, George, 105
Sugar Loaf Mountain, Va., 58
Surgeon-General's Office, 46, 74, 126, 127, 136; Library of, 213–277, 316, 356
Swammerdam, Joh., 147
Swinburne, 134
Sydenham, Thomas, 239, 274

Taft, William H., 321, 394
Tanaka, Inaki, 301
Tappahannock, Va., 93
Taylor, Dr., 101
Tenon, J. R., 155
Texas fever, report on, 150–152
Thackeray, W. M., 377
Thayer, William S., 209, 210, 211
Thierfelder, J. G., 338
Thiersch, Carl, 194
Thomas, Henry M., 209
Thorne, Richard Thorne, 272
Thornton, Charles, 18
Tilden, Samuel J., 289
Tilden Trust, 289, 291
Timmins, Samuel, 335
Todd's Tavern, Va., 78, 80, 81, 134–135
Torbert, Alfred T. A., 74, 95
Totopotomoy Creek, Va., 98, 99
Townsend, Miss Lucille R., 307
Traube, Ludwig, 235
Trevilian Station, fight at, 114, 117
Tripler, Charles S., 21, 30
Trousseau, Armand, 239
Turner, Benjamin, 88
Turner, Thomas J., 162
Tyler, Robert O., 91, 118, 119, 143

Union Hotel Hospital, 20, 22, 131
United States Ford, Va., 41, 42, 43, 50

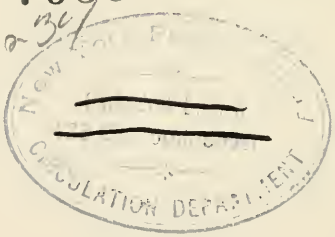
University of Pennsylvania, 278–282, 290

Van Wyck, Robert A., 303
Vaughan, Henry, 375
de Vauvenargues, Luc de C., 210
Velpeau, A. A. L. M., 10
Verneuil, Aristide, 358
Very, Mrs., 295
Victoria, Queen, 305
Virchow, Rudolf, 12, 138, 149, 150, 169, 214, 249, 337

Wagner, Clinton, 35, 37
Walcott, Charles D., 329, 347, 348, 382
Walcott, William H., 132–133
Walker, Francis A., 345
Wallace, Lewis, 118
Waller, Augustus Desiré, 239
Ware, William, 296, 297
Waring, George E., 176
Warren, Gouverneur K., 77, 81, 82, 95, 102, 111, 130
Warrenton Junction, Va., 76
Washington, D. C., attack on, 119–121
Watertown, N. Y., 70, 71
Wawepex Club, 313
Weed, Stephen H., 36
Welch, William H., 207, 209, 211, 219, 263, 277, 329, 330, 332–333, 339, 391
Weljaminow, N. A., 245–246
Westminster Abbey, 193
West Philadelphia, 107
West Point Hospital, 160
White, Edward D., 347
White Church, Pa., 62, 64
White House, Va., 95, 100, 103, 105, 106, 108, 109
Whittingham, Edward T., 48–49, 61, 63
Wilderness, battle of the, 78–80, 128–130
Willet's Point, 156
Williams, J. Whitridge, 209
Williams, Seth, 88, 95, 104
Wilson, Henry, 149
Wilson, James H., 114, 115
Wilson, John M., 95
Wilson, Sir W. J. Erasmus, 13
Wilson, Mrs. William Hanna, 329, 406
von Winckel, Franz, 333, 338
Windsor, Thomas, 226, 294
Winne, Charles K., 80
Winsor, Justin, 335
Wise, Thomas A., 215
Wistar parties, 280
Wood, Horatio C., 386
Wood, Thomas, 13
Woodhull, Alfred A., 19, 131, 136, 137, 138, 140, 142, 145, 150, 154, 223, 264, 275, 384, 387, 394
Woods Hole, Mass., 307–308
Woodville Mine, Va., 78
Woodward, Joseph Janvier, 138, 142, 213
Woodward, Robert S., 329, 348–354, 355–356, 384
Wright, Carroll D., 347
Wright, Horatio G., 82, 97, 101
Wright, James Homer, 210, 279, 280
Wright, Marmaduke Burr, 12, 17, 18

Yarrow, Dr. Henry C., 223, 268
Yellow fever, 163, 164, 176–180, 242–243, 340
Young, Thomas, 337, 338

7689



CENTRAL RESERVE
5TH AVE. & 42ND ST., ROOM 100

